Health Outcomes Associated with Attending Church, Praying, and Religiosity are Moderated by Religious, Spiritual, and Atheist Identities

by

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ABSTRACT

Research investigating Religion/Spirituality and health often notes that Religious/Spiritual constructs (i.e., attending church, praying/meditating, and religiosity) are associated with salutary outcomes. However, there is a consistent failure to investigate whether being non-religious, non-spiritual, or atheist affects the experience of Religious/Spiritual constructs. Using large, representative datasets from Canadian and American sources, it was investigated whether the relationships between Religious/Spiritual constructs and health outcomes, were moderated by Religious/Spiritual identities. This series of four interrelated studies converged on three findings. First, the non-religious, non-spiritual, and atheists tended to experience Religious/Spiritual constructs less positively than the religious, spiritual, or non-atheists. Second, when the non-religious, non-spiritual, and atheists reported higher levels of Religious/Spiritual constructs, these groups reported poorer health than the religious, spiritual, or non-atheists. Third, when considering subsets of the non-religious, non-spiritual, or atheists, Religious/Spiritual constructs were never associated with salutary outcomes. The discussion focused on the role of Religious/Spiritual identities affecting the experience of Religious/Spiritual constructs, and the advantages of not treating atheism as a Religious Identity.

Keywords: atheist, non-religious, non-spiritual, attendance, prayer, meditation, religiosity, self-rated health, emotional well-being, psychological well-being, happiness, satisfaction with life, General Social Survey, Canadian Community Health Survey, linear regression, homoscedasticity, heteroscedasticity, statistical moderation

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Personally speaking, I would like to thank my wife Betsy for her support and encouragement during the lengthy writing process. I would acknowledge that she is very well informed about Religion/Spirituality and health, yet is unlikely to list this topic as one of her interests. And for this extreme kindness, I will refrain from embarrassing her within this Acknowledgements page. Additionally, I would thank Ms. Aliya Bowles-Butler for her willingness to play quietly and "go get coffee" for me. These behaviours made the writing process far less tedious than it would have been otherwise.

PREFACE

Initially, this dissertation was proposed as an investigation of the relationship between atheism and health. Atheism and health is largely understudied within the Religion/Spirituality literature, and the health implications of atheism are poorly understood. The author's dissertation committee was supportive of his chosen topic, and the proposal received ethics approval without substantial revisions.

Unfortunately, much of what was planned for recruitment turned out to be impractical. For example, it was initially proposed that a representative cross-section of the population be used. Much of the literature addressing atheism used non-general samples, which limited generalization. To address this potential issue, the researcher proposed that recruitment take place in accessible public locations (e.g., malls). Unfortunately, these types of places would not allow this type of data collection to occur. Specifically, religion was seen as politically sensitive, and it was feared that it would alienate persons frequenting these locations. While recruitment from MUN was possible, such a sample would not be representative of a wider population

There were additional problems with the initial proposal, specifically the demographics of atheists within Newfoundland and Labrador. The exact number of atheists within the province of Newfoundland and Labrador is unknown due to the rarity of this type of data collection. However, as a proxy indicator of atheism it is informative to note that Newfoundland and Labrador is the most religious province in Canada, with only 6.18% of the province identifying as "non-religious". This figure (6.18%) is approximately five times lower than the national average, and it is likely that atheists

have proportionally lower numbers as well. Essentially, if a general sample of atheists were desired, thousands of persons would have to be recruited in order to get an adequate sample of non-believers. Because of these difficulties, the scope of the investigation was broadened to include the non-religious as well. The non-religious are also an understudied group within the Religion/Spirituality-health literature, and represented an area in which significant knowledge advances could be made. However, even with this comparatively larger group of persons, over 1500 participants would have to be recruited in order to get an adequate sample of the non-religious within NL. In essence, atheists and the non-religious were small subsets of the population, and there was not a practical way in which to representatively sample them.

However, it was realized that many questions of interest could be investigated with pre-existing databases (i.e., Canadian Community Health Services, General Social Survey). These databases would solve two important issues: representative sampling (all databases used nationally representative cluster sampling) and low recruitment (all databases had *N*s that adequately represented the target groups). While usage of archival data has drawbacks (notably reliance on which questions were asked), there was no other viable way in which to recruit the numbers needed for this project at a local level. With that caveat, it should be noted that the quality of the data in the current study is far superior to what could have been collected at a local level. Moreover, this dissertation did not require highly specialized data and was able to investigate the research topics with only general data. Consequently, a much stronger series of studies was produced using archival data than what would have been produced using non-archival data.

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List of Abbreviations and Terms

EWB – Emotional Well-Being (Study 1)

Negative atheists – persons who indicated that they did not believe in god(s) (Study 3 and Study 4)

Positive atheists – persons who indicated that they did not believe in god(s), and expressed confidence that god did not exist (Study 3 and Study 4)

PWB – Psychological Well-Being (1)

R/S – Religion/Spirituality; Religious/Spiritual

R/S constructs – a term denoting three Religious/Spiritual variables [Attendance (i.e., attending church services), Prayer and/or Meditation (NB: in Study 3 and Study 4 this would only address Prayer), and Religiosity (i.e., the extent to which someone identifies as valuing religion, or the extent to which a person indicates religion is salient to him/her)]

R/S identities – the ways in which a person can identify religiously or spiritually; R/S identities would encompass all R/S Majority and R/S Minority identities

R/S Majority – persons who identify as religious, spiritual, and/or believing in god(s)

R/S Minority – persons who do not identify as religious, spiritual, and/or believing in god(s) (NB: this term is not meant to imply that all persons are religious and/or spiritual, it was used only as a shorthand to provide contrast to R/S Majorities)

SRH – Self-Rated Health (Study 1, Study 2, Study 3, and Study 4)

SWL – Satisfaction with Life (Study 2)

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An Overview of Religion/Spirituality and Health Research

Religion and Spirituality (R/S) continue to exert substantial influence within Western culture. Despite declining numbers of persons identifying as "religious" (O'Brian-Baker & Smith, 2009; Hout & Fischer, 2002), the vast majority of persons indicate that they belong to a religious tradition (Schwadel, 2010). The pervasiveness of R/S has catalyzed extensive psychological research on the topic including, but not limited to, attitudes (Allport & Ross, 1967), behaviours (Hummer, Rodgers, Nam, & Ellison, 1999), information processing (Hunter, 2001), values (Broeckaert, Gielen, van Lersel, & van den Branden, 2009), as well as personality (Khoynezhad, Rajaei, & Sarvarazemy, 2012). However, one of the largest areas of research describes the relationship between R/S and health outcomes.

Definitions of Religion/Spirituality

Religion is generally defined as a person's affiliation with an organized social group, which has features such as institutionalization and specific metaphysical holdings [e.g., belief in afterlife, source of morality (Thoresen & Harris, 2002)]. Spirituality is defined in a variety of ways within the extant literature, with many studies disagreeing on the exact substance of the term (Hill & Pargament, 2003; Pesut, Fowler, Taylor, Reimer-Kirkham, & Sawatzky, 2008; Tanyi, 2002). Unfortunately, spirituality is difficult to define in a manner that is inclusive of the various conceptualizations of spirituality, as well as exclusive of ideas that are not spirituality. Miller and Thoresen (2003) defend spirituality as consisting of "immaterial features of life", although do not provide a criteria for including and excluding ideas that are related to spirituality.

Generally, the distinction between religion and spirituality hinges on the idea that spirituality is a subjective experience that is intrinsic, while religion is a less subjective experience with social institutions (Thoresen & Harris, 2002). However, spirituality measures will often have religiously themed questions [e.g., "I have a personal relationship with a personal relationship with a power greater than myself" (Hatch, Burg, Naberhaus, & Hellmich, 1998; Korinek & Arredondo, 2004)], so the separation of these constructs is arguably semantic. For the purpose of the current studies, R/S will be treated as a unified construct.

Religion/Spirituality and Health Outcomes

Research into R/S-health is extensive and has addressed both objective physical outcomes, and subjective non-physical outcomes. Religion/Spirituality has been linked to higher levels of preventative care (Benjamins, 2005; Benjamins, Trinitapolli, & Ellison, 2006; Benjamins & Brown, 2004), fewer negative adverse health behaviours (Masters & Knestel, 2011; Mullen & Francis, 1995; Strawbridge, Cohen, & Shema, 1997; Yohannes, Koenig, Baldwin & Connolly, 2008), reduced self-harm (Kuentzel, Arble, Boutros, Chugani, & Barnett, 2012), and greater longevity (Clark, Friedman, & Martin, 1999; Hummer et al., 1999; Idler & Kasl, 1992; Koenig, 2009; Koenig & Hays, 1999; Levin, Chatters, & Taylor, 2006; Oman & Reed, 1998; Schnall et al., 2010). While objective health measures are sporadically addressed within the extant literature, the current study will limit its focus to more subjective self-report health data. This limitation means that the findings of the current study may not necessarily extend to assessments of objective

health outcomes. However, this limitation is necessary in order to manage the scope of the current investigation.

In regards to subjective non-physical outcomes, R/S is associated with substantial improvements to well-being [e.g., happiness, self-rated health, satisfaction with life, mental well-being (Baker & Cruickshank, 2009; Dunn, 2008; Eliassen, Taylor, & Lloyd, 2005; Harris, Sherritt, Holder, Kulig, Shrier, & Knight, 2008; Huang, Hsu, & Chen, 2012; Koenig, 1995; Krause, 2003a; Krause & Hayward, 2012; Maselko & Buka, 2008; Rosmarin, Bigda-Peyton, Kertz, Smith, & Rauch, 2013; Strawbridge, Shema, Cohen, & Kaplan, 2001).

Religion/Spirituality-health research will often investigate whether specific beliefs and behaviours are associated with positive health outcomes. In this regard, attending church (i.e., Attendance), praying or meditating (i.e., Prayer/Meditation), and valuing religion (i.e., Religiosity) have been studied extensively. These R/S constructs are, arguably, the most widely studied aspects of R/S, and will be the main focus for much of this dissertation. Consequently, the term "R/S constructs" refers *exclusively* to these three variables (i.e., Attendance, Prayer/Meditation, and Religiosity).

Attendance and Religiosity are often associated with a variety of positive health outcomes [Attendance (Benjamins, 2005; Benjamins, 2006; Bryant & Rakowski, 1992; Ellison, Boardman, Williams, & Jackson, 2001; Harris, Edlund, & Larson, 2006; Hummer et al., 1999; Koenig, 1995; Koenig & Hays, 1999; Krause, 2003a; Krause, 2003b; Krause, 2005; Krause, 2010; Krause & Hayward, 2012; Krause, Ellison, Shaw, Marcum, & Boardman, 2001; Levin & Chatters, 1998; Okulicz-Kozaryn, 2010; Oman &

Reed, 1998; Strawbridge et al., 1997; Strawbridge et al., 2001; Strawbridge, Cohen, & Shema, 2000; Yohannes et al., 2008); Religiosity (Acevedo, 2010; Baker & Cruickshank, 2009; Benjamins & Brown, 2004; Clark et al., 1999; Gauthier, Christopher, Walter, Mourad, & Marek, 2006; Horning, Davis, Stirrat, & Cornwell, 2011; Idler & Kasl, 1992; Kuentzel et al., 2012; Levin & Chatters, 1998; Levin & Markides, 1986; Mochon, Norton, & Ariely, 2011; Park, Lee, Sun, Klemmack, Roff, & Koenig, 2013)]. In contrast, Prayer/Meditation has been linked to positive health outcomes (Ellison, Bradshaw, Stroch, Marcum, & Hill, 2011; Levin & Chatters, 1998), negative health outcomes (Ellison et al, 2001; Galek, Krause, Ellison, Kudler, & Flannelly, 2007; Krause & Wulff, 2004; Gillum & Griffith, 2010), or has been found to be unrelated to health outcomes (Krause, 2003b; Krause, 2005; Musick, Koenig, Hays, & Cohen, 1998). Whereas Attendance and Religiosity appear to be positive predictors of health, because Prayer/Meditation is used as a coping strategy (Krause, 1998; Schnittker, 2003) its directionality with health outcomes is inconsistent.

Issues with the R/S-Health Research

While the extant literature supports the idea that R/S constructs (Attendance, Prayer/Meditation, and Religiosity) are associated with a variety of health outcomes, this body of literature is not without its critics. Notably, researchers have drawn attention to the inconsistent effect sizes associated with R/S constructs and health outcomes (Sloan & Bagiella, 2001), as well as the conspicuous absence of covariate control in many studies (Sloan & Bagiella). Moreover, the approaches used to address R/S constructs often make assumptions about religion and/or spirituality that do not necessarily correspond with

reality, or make methodological errors that threaten the validity of the findings [e.g., low religiosity is assumed to indicate high secularity (Hwang, Hammer, & Cragun, 2011).Generally, criticism of the R/S-health centres on the idea that the R/S-health relationship is exaggerated (Sloan & Bagiella; Thoresen & Harris, 2002).

However, a large issue within the literature which has not received much attention is whether R/S constructs are experienced uniformly by everyone. The tacit position of the literature is that whether a person is religious/non-religious, spiritual/non-spiritual, or atheist/non-atheist is *irrelevant* to whether he/she would experience R/S constructs positively. To evince this point, Academic Search Premier, CINAHL, PsycINFO, and SocINDEX databases were screened for journal articles related to R/S constructs; health outcomes; the non-religious, non-spiritual, or atheists; and statistical moderation/mediation. These journal articles had to be peer-reviewed and be in English. Overall, the search string resulted in 637 hits (see Appendix A). Individual abstracts were screened for their relevance to the research question posed. Of the screened abstracts, 24 were included for further review because they were ostensibly related to R/S identities moderating the relationship between R/S constructs and health outcomes. Of the 24 retained for further review, only 2 of these articles addressed whether R/S identities influenced the salutary effects of R/S constructs, albeit in a very limited scope.

These two articles addressed the relationship between prayer and immediate pain relief (Dezutter, Wachholtz, & Corveleyn, 2011; Jegindø et al., 2013). Both studies had groups of religious persons and non-religious persons pray to a personal god in order to relieve pain. Results of both studies suggest that prayer alleviated pain in the religious

participants, but not the non-religious participants. Dezutter et al. generally concluded from this element of the study that prayer was effective (in terms of perceived pain) for the religious, but not for the non-religious. Jegindø et al. drew similar conclusions from the available data. While the implications of these findings were discussed to some extent within their respective articles, there was a tendency for those studies to focus on the idea that praying could be associated with salutary effects. While this analysis of the findings is accurate, it was puzzling that the implications of these findings were not built on to explore the *boundaries* of the benefits of prayer.

A different study that was initially discarded by the filter was by Krägeloh, Chai, Shepherd, and Billington (2010), who investigated the relationship between Religious/Spiritual coping and health. In this study the religious and non-religious were analyzed separately, and results revealed several notable differences. These differences centered on the relationship between religious coping and health outcomes. For example, if a non-religious person "turned to religion" it was positively associated with denial, but the same relationship did not emerge for a religious person. Additionally, "turning to religion" was positively associated with acceptance for a religious person, but not for the non-religious. In short, participation in R/S-themed activities had different implications for religious and non-religious groups.

It should be noted that the extant literature has investigated whether *Religiosity* moderates the experience of R/S (Ellison, Fang, Flannelly, & Streckler, 2013; Krause & Wulff, 2004; van Tongeren, McIntosh, Raad, & Pae, 2013). In these cases the literature has found that more religious persons tend to find religious doubt more deleterious to

their overall health. While using Religiosity appears to be a reasonable approach in assessing the variation within R/S identities, there is a subtle conceptual issue that is overlooked. Only noting levels of Religiosity without capturing R/S identities produces equivalency issues. This approach assumes that a "highly religious 'non-religious' person" and a "highly religious 'religious' person" are comparable. This approach also ignores why a non-religious person would perceive themselves as being "highly religious" in the first place.

While the failure to investigate R /S identities as moderators is understandable within small underpowered studies, in large representative samples it is mystifying. In studies using national data (e.g., Benjamins, 2005; Benjamins & Brown, 2004; Ellison & Burdette, 2012; Ellison et al., 2001; Galek et al., 2007; Hayward & Krause, 2014; Koenig & Hays, 1999; Krause, 2005; Krause, 2006; Krause, 2010; Greenfield & Marks, 2007; Mochon, Norton, & Ariely, 2011) researchers will routinely report that Attendance and Religiosity are associated with salutary effects. However, there is virtually no investigation as to the uniformity of these effects (e.g., Greenfield & Marks; Koenig & Hays; Krause, 2005, 2006, 2010; Mochon et al.). While studies are unable to investigate *all* potential moderator terms, specifically omitting R/S identities as potential moderators is perplexing. Questions related to assessing R/S identities (e.g., "What religious affiliation do you identify as?"), are routine questions within many national datasets. Within these large general samples there is adequate power to investigate moderation terms, and there appears to be an obvious connection between R/S identities and the experience of R/S constructs.

The Current Studies

The goal of this dissertation is to investigate whether various R/S identities moderate the relationship between R/S constructs and health outcomes. This appears to be the first time that this topic has been investigated with the explicit purpose of establishing group differences in large representative samples. The dissertation used three broad R/S identities (Religious/Non-Religious, Spiritual/Non-Spiritual, and atheist/non-atheist) to investigate this research question. The term "R/S Minorities" is used to describe the non-religious, non-spiritual, or atheists; it is admittedly imperfect as the implication is that *everyone* therefore is religious and/or spiritual (which is obviously untrue). To clarify this point explicitly, R/S Minorities is *only* a term of convenience that is being used to contrast the term "R/S Majorities" which would encompass the religious, spiritual, or non-atheist.

This dissertation is comprised of four interconnected studies, each of which investigated the moderating role of R/S identities on R/S constructs. For theoretical reasons described in Study 1, all moderation terms were predicted to be positive, as that would indicate that R/S Minorities experienced R/S construct less positively than R/S Majorities. All directional hypotheses were assessed with one-tailed tests and all non-directional hypotheses were assessed with two-tailed tests, each with an overall $\alpha < .05$. The individual studies and their general research questions were:

Study 1: Does Religious Identity, Spiritual Identity, or combined Religious/Spiritual Identity moderate the relationship between R/S constructs and

health outcomes (Emotional Well-Being, Psychological Well-Being, and Self-Rated Health) in a large representative Canadian sample?

Study 2: Does Religious Identity moderate the relationship between R/S constructs and health outcomes (Happiness, Self-Rated Health, and Satisfaction with Life) in a large representative Canadian sample? Do these moderated relationships remain significant when controlling for social support and mastery covariates?

Study 3: Do atheist identities moderate the relationship between R/S constructs and global subjective health in a large representative American sample? Are atheists less healthy than non-atheists?

Study 4: Do atheist identities moderate the relationship between R/S constructs and global subjective health in large representative American, non-religious sample? Are atheists less healthy than non-atheists?

Limitations. The current dissertation relied exclusively on pre-existing national datasets in order to investigate its research questions. Consequently, the largest limitation within the current studies was the data contained within these national datasets. All outcome measures used in the current study were dependent on self-report and several of these outcome measures were only single-item responses. While one could justify the usage of these measures by citing previous research (e.g., Assari, 2013; Diener & Clifton, 2002; Green & Elliot, 2010; Greenfield & Marks, 2007; Idler, McLaughlin, & Kasl, 2009; Krause, 2006, Okulicz-Kozaryn, 2010), this does not actually address whether the used health outcome measures were valid or reliable. Therefore it is important to note that

research addressing the quality of single-item, subjective assessments of health are supportive of these measures having good predictive validity (e.g., Andrews & Crandall, 1976, Headey, Hoehne, & Wagner, 2014; Idler & Benyamini, 1997; Knäuper & Turner, 2003; Kuhn, Rahman, & Menken, 2006; McDowell, 2006).

A separate limitation is the fact that R/S topics are sensitive to social desirability bias, and therefore, the meaningfulness of the data collected. Hackett (2014) noted that data collection addressing this topic is plagued with subtle issues that may influence the data provided by respondents. However, this issue is relevant to *any* research addressing sensitive topics, and should not be thought as preventing meaningful research on the given topic.

Data analysis. All data analysis used Stata 13. In each study, data was centered (West, Aiken, & Krull, 1996) and continuous variables were standardized. Both of these analytical decisions were to improve interpretability of the regression model. All regression modelling used robust standard errors to correct for issues with heteroscedasticity (Long & Ervin, 2000). It is noteworthy that the literature using large representative samples routinely fails to test for heteroscedasticity, or routinely fails to mention testing for heteroscedasticity (e.g., Ellison et al., 2001; Krause, 2005, 2006, 2010; Greenfield & Marks, 2007). This omission is troubling as homoscedasticity is a major underlying assumption of linear regression, and is unlikely to be present in large, non-simple randomized samples. The consequence of failing to address issues with heteroscedasticity is very problematic, as this omission results in an inflated Type I error rate. Discussion on the analytical techniques is provided in Appendix B.

Study 1: Testing Religious Identity and Spiritual Identity as Moderators

In the introduction, it was noted that the Religion/Spirituality-health literature has inadequately investigated the potential of group membership in a R/S Minority (i.e., non-religious, non-spiritual, atheist) to moderate the relationship between R/S constructs (Attendance, Prayer/Meditation, and Religiosity) and health outcomes. An objection to this criticism may be that the extant Religion/Spirituality-health literature often takes general samples, and therefore the non-religious are adequately represented in the data (e.g., Benjamins, 2005; Benjamins & Brown, 2004; Clark et al., 1999; Cohen & Hall, 2009; Ellison & Burdette, 2012; Galek et al., 2007; Harris et al., 2006; Hayward & Krause, 2014; Idler & Kasl, 1992; Krause, 2003a; Levin & Chatters, 1998; McFarland, Wright, & Weakliem, 2011; Schnall et al., 2010; Webb, Charbonneau, McCann, & Gayle, 2011). While it is true that the non-religious are included within representative samples, it is also important to note that these samples are dominated by R/S Majorities [~85% (Schwadel, 2010)], which has analytical consequences.

Because of the discrepancy in sample size, the effects described within general samples are heavily influenced by the R/S Majority component of the sample. Framed slightly differently, the results would suggest that a population consisting largely of religious persons, spiritual persons, or non-atheist persons appear to benefit from R/S constructs. So while general samples are used to investigate the relationship between R/S constructs and health outcomes, this should not be equated with the idea that R/S Minorities are therefore adequately represented. Moreover, within these large national samples there is adequate power to investigate R/S identities acting as moderators, so

statistical issues are likely not responsible for this omission. Granted, there are specific cases in which R/S Minority groups are underrepresented within general samples, which would preclude moderation terms from investigation (e.g., Hayward & Krause, 2014), but these studies appear to be the exception rather than the rule.

While one should only test moderation if there is a specific theoretical basis to suspect group differences, this objection is not viable for the current topic. Researchers *have already acknowledged* that the non-religious may experience R/S differently than the religious (Ellison & Levin, 1998; Gauthier et al., 2006; Hayward & Krause, 2014; Krause & Wulff, 2004). While these comments have not catalyzed substantive research, there has been tentative recognition from published literature that, perhaps, R/S Minorities represent a distinct group

Another reason to suspect group differences between R/S Minorities and R/S Majorities are the hypothesized reasons for *why* R/S constructs promote better subjective health. While there are competing explanations to account for better subjective health outcomes (Dyer, 2007; George, Ellison, & Larson, 2002; Perry, 1998; Johnstone, Glass, & Oliver, 2006), one of the contenders to explain these effects is the "coherency hypothesis" (Antonovsky, 1993). Coherency is validate concept that suggests persons who are able to "make sense" of their world, or that the world behaves predictably, tend to be healthier. The coherency hypothesis has been used by the R/S literature to explain the R/S health relationship. Essentially, R/S (or R/S constructs) provide persons with a coherent worldview, which indirectly promotes non-physical well-being through optimism and a dependable ideological structure (Idler, 1987; Krause, 2011). The crucial

aspect of this coherency hypothesis is that its tacit underpinnings are not action-based, but perception-based. In other words, R/S constructs are theorized to promote health, because the persons engaging in the R/S constructs value those beliefs and behaviours.

However, given that group identities are often a reflection of shared beliefs or values (Myers, Spencer, & Jordan, 2012), it would be unusual that a group identity formed *on the basis* of Religion/Spirituality would then be unrelated to the experienced of Attendance, Prayer/Meditation, and Religiosity. Generally speaking, R/S Majorities report higher levels of participation in R/S constructs (O'Brian-Baker & Smith, 2009), give higher evaluations of R/S topics (Caldwell-Harris, Wilson, LoTempio, & Beit-Hallahmi, 2011), and give higher evaluations of spirituality (O'Connell & Skevington, 2005). Given these differences, it is not unreasonable to infer that R/S Minorities, on average, value R/S constructs to a lesser degree. Consequently, if benefits associated with R/S constructs are due to the valuation of R/S constructs, then R/S Majorities would likely report greater benefits.

Finally, studies that have addressed group differences have found results indicating that R/S Minorities extract fewer benefits from R/S constructs than R/S Majorities. As noted earlier, Dezutter et al. (2012) and Jegindø et al. (2013) established that the benefits associated with prayer were moderated by whether a person was religious, and Krägeloh et al. (2010) found that the religious and the non-religious reported different relationships between R/S and health outcomes. In each of these cases, R/S Minorities benefitted less than R/S Majorities in regards to R/S constructs. In

summary, it is reasonable to suspect that R/S Minorities will extract fewer benefits from R/S constructs.

The goal of Study 1 is to examine the relationship between R/S constructs and a variety of health outcomes (i.e., emotional well-being, psychological well-being, and Self-Rated Health). Study 1 is divided into two parts, Study 1.1 will use Religious Identity and Spiritual Identity as separate moderators of R/S constructs; and Study 1.2 will combine Religious Identity and Spiritual Identity together. The combination of Religious Identity and Spiritual Identity was used to produce a stronger identity manipulation by reducing heterogeneity of the group. The outcomes being assessed in Study 1 are emotional well-being, psychological well-being, and self-rated health. Previous research has confirmed that Attendance and Religiosity positively predict these outcomes, and that Prayer/Meditation is often linked to these outcomes (Ellison et al., 2001; Gauthier et al., 2006; Krause, 2010; Levin & Chatters, 1998; Okulicz-Kozaryn, 2010; Park, Lee, Sun, Klemmack, Roff, & Koenig, 2013).

Method

Data Source

The Public Use Microfile for the Canadian Community Health Survey, 2012 Annual Component was accessed in order to investigate all research questions (Statistics Canada, 2013a). The Canadian Community Health Survey is a national cross sectional survey that collects information on health-related behaviours of Canadians (e.g., self-reported health, depression, exercise, preventative care usage, etc.). The survey employs clustered, stratified sampling, and represents approximately 98% of the Canadian

population above the age of 12 (Statistics Canada, 2013b). Study 1.1 and Study 1.2 used slightly different samples from the Public Use Microfile, but overwhelmingly used the same survey items (with one exception).

Survey Items

Demographics. Age (in 5 year intervals), sex (male/female), household income ($0-19999, $20000-39999, $400000-59999, $60000-79999, $80000+), highest education level of respondent (Less than high school, High school graduate, Some post-secondary, Post-secondary graduate), marital status [no partner/partner (including common-law)], minority status (white/non-white), and region [New Brunswick/Manitoba (the only two provinces that completed the religion module within the Canadian Community Health survey)].

R/S constructs. Three items regarding R/S constructs: a five-point item regarding church Attendance ("Not counting events such as weddings or funerals, during the past 12 months, how often did you participate in religious activities or attend religious services or meetings?"), a six-point item regarding Prayer/Meditation ("In the past 12 months, how often did you engage in religious or spiritual activities on your own, including prayer, meditation and other forms of worship taking place at home or in any other location?"), and a four-point item regarding Religiosity ["In general, would you say that you are: (very religious, religious, not very religious, not very religious at all)?"]. For easier interpretability, all R/S constructs were reverse coded so that higher scores indicated greater magnitude of Attendance, Prayer/Meditation, or Religiosity.

Mental health. The Mental Health Continuum – Short Form (MHC-SF) was used to assess mental health in respondents, with higher scores indicating greater mental health (Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2010). The MHC-SF assessed well-being with three subscales: Emotional Well-Being (EWB) [three items (e.g., "In the past month, how often did you feel happy?"), Psychological Well-Being (PWB) [six items (e.g., "In the past month, how often did you feel that you liked most parts of your personality?"), and Social Well-Being (SWB) [five items (e.g., "In the past month, how often did you feel that you belonged to a community"). The MHC-SF had an overall Cronbach's $\alpha = .859$, with the EWB subscale (Cronbach's $\alpha = .799$) and PWB subscale (Cronbach's $\alpha = .797$) having acceptable levels of reliability. The SWB subscale (Cronbach's $\alpha = .737$) was not used because it had items that were likely to encompass religious activities, which would have represented a substantial confound in interpreting the effects of religious behaviours. Additionally, when these "religiously-connected" items were deleted from the scale, then Cronbach's α fell to unacceptable levels ($\alpha = .541$). Therefore, only the EWB and PWB subscales were used, with each being assessed as a separate outcome variable.

Self-Rated Health. A five-point item was used to assess global subjective well-being [i.e., "In general, how would you say your health is now? Is it… (Excellent, Very good, Good, Fair, or Poor)]. Scores for self-rated health (SRH), were reverse coded so that higher scores indicating higher levels of well-being.

Identity. Two questions were used as grouping variables in Study 1.1. These questions related to how a respondent identified him/herself, or how important a

respondent rated a construct to be. These two questions were later synthesized to make a third grouping variable in Study 1.2.

Religious Identity. Study 1.1 used a single item to assess Religious Identity (i.e., "What is your religion?"). Responses were limited to Christian, Religious Non-Christian, and Non-Religious. Religious Non-Christians were excluded from analyses because:

1) Levels of the reported R/S constructs may be dependent on Religious Identity. While Christianity *is* diverse, it was thought that intergroup variability would pose a larger threat than intragroup variability.

2) The vast majority of existing literature will often confine itself to Christians, and a goal of the current study was to refine this research. This is not meant to downplay the importance of other religions (which represented ~10% of the sample), but is an attempt to manage the scope of the current study.

Spiritual Identity. A single item was used as a spirituality grouping variable ["Do spiritual values play an important role in your life?" (Statistics Canada, n.d.)]. Persons who answered "Yes" to this question were classed as "Spiritual", and persons who answered "No" to this question were classed as "Non-Spiritual". While the response to the question is not technically an identification of spirituality, it does reflect a valuation of spirituality. The literature has repeatedly emphasized the subjective nature of spirituality, so the Spiritual/Non-Spiritual binary is thought appropriate because it would essentially allow persons to self-identify as being "spiritual".

Religious & Spiritual Identity. For Study 1.2 Religious Identity and Spiritual Identity were combined to make a Religious and Spiritual Identity variable. Only persons

who indicated that they were both non-religious and Non-Spiritual (Non-Religious/Non-Spiritual) or a Christian and Spiritual (Christian/Spiritual) were retained for Study 1.2 (which eliminated 945 persons from Study 1.1). The decision to combine similar groups and exclude dissimilar groups was done to produce a stronger manipulation.

Study 1.1

Study 1.1 investigated Self-Rated Health (SRH), emotional well-being (EWB), and psychological well-being (PWB). Each outcome variable had its own regression model, and identical hypotheses were tested for *each* regression model:

Block 1: Demographic covariates were entered. Efforts were taken to ensure that demographic factors that were related to health outcomes or R/S construct were controlled for [e.g., sex (Koenig & Hays, 1999), age (Krause, 2003b), race (Krause, 2003b), education (Krause, 1998)].

Block 2: R/S constructs were entered.

Block 3: Religious Identity was entered; the non-religious were the reference group.

Block 4 (stepwise regression): Religious Identity was tested as a potential moderator for Attendance, Prayer/Meditation, and Religiosity in their individual relationships with the outcome variable.

Hypothesis: Moderator terms were predicted to be positive (this is a one-tailed hypothesis). This would support the contention that, for the non-religious, R/S constructs have a less positive relation with health outcomes than they do for the Christians.

Hypothesis: When compared on the highest levels for any moderated R/S construct, the non-religious are predicted to report lower health than Christians (this is a one-tailed hypothesis). This would support the contention that the non-religious experience higher levels of R/S constructs less positively than the religious.

Block 5: Block 3 and Block 4 were removed and Spiritual Identity was entered; the Non-Spiritual were the reference group.

Block 6 (stepwise regression): Spiritual Identity was tested as a potential moderator for Attendance, Prayer/Meditation, and Religiosity in their individual relationships with the outcome variable.

Hypothesis: Moderator terms were predicted to be positive (this is a one-tailed hypothesis). This would support the contention that the Non-Spiritual experience R/S constructs less positively than the Spiritual.

Hypothesis: When compared on the highest levels for any moderated R/S construct, the Non-Spiritual are predicted to report lower health than the Spiritual (this is a one-tailed hypothesis). This would support the contention that the Non-Spiritual experience higher levels of R/S constructs less positively than the Spiritual.

Participants

Respondents had to answer all questions related to the outcome variables, R/S constructs, demographic variables, and all identity questions. Respondents who answered a question with “I don’t know” or “Refuses to state” were excluded from the dataset in

order to maintain the continuous nature of the data. Persons less than 20 years of age were excluded due to concerns over autonomy in circumstances related to R/S constructs. For example, a 15 year old may have attended church as part of a familial ritual, rather than an intrinsic desire to attend. Unfortunately, only residents of New Brunswick and Manitoba were asked questions pertaining to religion. Consequently, the findings from Study 1.1 and 1.2 are limited to persons from these provinces and do not necessarily extend to other Canadian regions. There were 5468 potential respondents. Of these 5468 respondents, 1470 were eliminated due to failing to answer all health related questions. A further 507 respondents were eliminated due to a failure to answer all R/S questions.

There were 3491 respondents who answered all questions. The demographics were skewed toward females (1499 male, 1992 female), with the average age of the respondents falling between 45 and 49 years of age. New Brunswick and Manitoba were comparably represented (NB = 1696 respondents, MB = 1795 respondents). As expected, Religious Identity skewed substantially towards persons identifying as religious [non-religious (N = 377; 12.11%); Christians (N = 3114; 87.89%)] and spiritual [Non-Spiritual (N = 1116; 32.00%); Spiritual (N = 2375; 68.00%)] please see Appendix C for a discussion on homogeneity of the different R/S identities by province. See Table 1.1.1 for descriptive statistics.

Results

Emotional Well-Being

Emotional Well-Being (EWB) was regressed onto demographic covariates in Block 1, $F(7, 3483) = 6.10$, $p < .001$, $R^2 = .033$. Religious/Spiritual constructs

(Attendance, Prayer/Meditation, Religiosity) were added in Block 2, ΔR^2 = .006, F(3, 3480) = 2.00, p = .114, R^2 = .038. Attendance positively predicted EWB, t = 2.14, p = .032, 95% CI [0.01, 0.16], while Prayer/Meditation and Religiosity did not predict EWB. Religious Identity was added as a predictor in Block 3, ΔR^2 = .000, R^2 = .038, but it was not a significant predictor t(3479) = 0.35, p = .729, but was not significant. Moderator terms were tested in Block 4 with stepwise regression, ΔR^2 = .003, R^2 = .041(see Figure 1.1.1). Religious Identity moderated the experience of Prayer/Meditation, t(3478) = 1.88, p = .030, 95% CI [0.03, 0.38]. The non-religious experienced Prayer/Meditation negatively and significantly, t(3478) = -2.01, p = .045, 95% CI [-0.40, -0.00].

Prayer/Meditation was re-centered on the highest level of Prayer/Meditation (i.e., "Once a day"), and group differences between Christians and the non-religious were compared at that point, Religious Identity positively predicted EWB, t(3478) = 2.14, p = .017, B = 0.43, 95% CI [0.10, 0.76]. When Prayer/Meditation was re-centered on the lowest level of Prayer/Meditation, (i.e., "Not at all"), Religious Identity was not a significant positive of EWB. In other words, Christians were healthier than the non-religious, *but only when the non-religious reported atypically high levels of Prayer/Meditation*. However, Christians prayed/meditated more frequently than the non-religious, t(520.15) = -21.62, p < .001; M_{diff} = -0.96, 95% CI [-1.05, -0.87], meaning that comparisons between the non-religious and Christians that failed to account for those differences, may erroneously ascribe health benefits for group membership..

Block 3 and Block 4 were removed and Spiritual Identity was placed in Block 5, ΔR^2 = .000, R^2 = .038, but it was not a significant predictor, t(3479) = 0.01, p = .995.

Spiritual Identity was investigated as a moderator in Block 6, $\Delta R^2 = .006$, $R^2 = .045$. Spiritual Identity significantly moderated the link between Religiosity and EWB, $t(3478) = 2.43$, $p = .008$, 95% CI [0.07, 0.38]. Religiosity was a non-significant predictor for both Non-Spirituals and Spirituals (see Figure 1.1.2). With the inclusion of the Spiritual Identity*Religiosity interaction term, Attendance ceased being a positive predictor of EWB, $t(3478) = 1.59$, $p = .112$, 95% CI [-0.02, 0.14] (see Table 1.1.2).

Non-Spirituals and Spirituals were compared on the highest level of Religiosity (i.e., "Very religious"). When Non-Spirituals and Spirituals reported the highest level of Religiosity, Non-Spirituals reported lower EWB in comparison to Spirituals, $t(3478) = 2.27$, $p = .012$, B = 0.54, 95% CI [0.15, 0.92]. When the Non-Spirituals and Spirituals were compared on the lowest level of Religiosity (i.e., "Not religious at all"), Spiritual Identity was not a significant predictor of EWB. Spirituals had better EWB, *but only at the atypically high levels of Religiosity*. In general, Spirituals were more religious than the Non-Spirituals, $t(2422.13) = -45.95$, $p < .001$; $M_{diff} = -1.26$, 95% CI [-1.31, -1.21], but the benefits associated with Religiosity were contingent on Spiritual Identity.

In a general follow-up analysis, it was investigated whether a sample consisting of only the non-religious or Non-Spirituals would report a positive relationship between R/S constructs and EWB. When these subpopulations were isolated, R/S constructs were not significant predictors of EWB. These findings support the contention that R/S constructs are not necessarily beneficial to R/S Minorities.

Psychological Well-Being

Psychological Well-Being (PWB) was regressed onto demographic covariates in Block 1, $F(7, 3483) = 2.41$, $p = .018$, $R^2 = .013$. Religious/Spiritual constructs were entered in Block 2, $\Delta R^2 = .007$, $F(3, 3480) = 2.82$, $p = .038$, $R^2 = .020$. Prayer/Meditation positively predicted PWB, $t = 2.09$, $p = .037$, 95% CI [0.01, 0.18], while Attendance and Religiosity were both non-significant predictors. Religious Identity was added in Block 3, $\Delta R^2 = .000$, $R^2 = .020$, but it was not a significant predictor $t = -0.54$, $p = .589$. Religious Identity was tested as a moderator in Block 4, but there were no significant interactions.

Block 3 and Block 4 were removed, and Spiritual Identity was inserted in Block 5, $\Delta R^2 = .002$, $R^2 = .022$, but it was not a significant predictor $t(3479) = 1.13$, $p = .257$. Interaction terms for Spiritual Identity and R/S constructs were assessed in Block 6, $\Delta R^2 = .006$, $R^2 = .027$. Spiritual Identity moderated the experience of Religiosity, $t(3478) = 1.96$, $p = .025$, 95% CI [0.03, 0.39], although neither group experienced main effects of Religiosity on PWB (see Figure 1.1.3).

When Non-Spirituals and Spirituals were compared on the highest level of Religiosity (i.e., “Very religious”), Spirituals had higher PWB, $t(3478) = 2.19$, $p = .015$, B = 0.61, 95% CI [0.15, 1.07] (see Table 1.1.3). When compared on the lowest level of Religiosity (i.e., “Not religious at all”), Spiritual Identity was not a significant predictor of PWB. Being a Spiritual was associated with better PWB, but only at the highest levels of Religiosity. In general, while Spirituals were more religious than the Non-Spirituals the health outcomes associated with higher Religiosity were not only non-significant, they were contingent on Spiritual Identity.

In follow-up analysis, samples consisting exclusively of the non-religious or Non-Spirituals were isolated. In these circumstances, R/S constructs were not significant predictors of PWB.

Self-Rated Health

Self-Rated Health (SRH) was regressed onto demographic covariates in Block 1, $F(7, 3483) = 31.34$, $p < .001$, $R^2 = .128$. In Block 2, R/S constructs were entered, $\Delta R^2 = .004$, $F(3, 3480) = 2.13$, $p = .095$, $R^2 = .132$. Attendance significantly predicted SRH, $t = 2.35$, $p = .019$, 95% CI [0.01, 0.15], while Prayer/Meditation and Religiosity did not predict SRH. Religious Identity was entered in Block 3 to predict SRH, $\Delta R^2 = .003$, $R^2 = .136$, but it was not a significant predictor $t(3479) = 1.90$, $p = .058$, but was not a significant predictor. Religious Identity was then tested as a potential moderator in Block 4 which was significant $\Delta R^2 = .004$, $R^2 = .139$. Results showed that Religious Identity moderated Prayer/Meditation, $t(3478) = 1.83$, $p = .034$, 95% CI [0.02, 0.46]. However, the non-religious did not experience Prayer/Meditation significantly, $t(3478) = -1.92$, $p = .055$, 95% CI [-0.50, 0.01], and Christians did not experience Prayer/Meditation significantly, $t(3478) = -0.17$, $p = .869$, 95% CI [-0.08, 0.07] (see Figure 1.1.4).

A follow-up analysis revealed when Christians and the non-religious reported the highest level of Prayer/Meditation (i.e., “Once a day”), being a Christian was associated with better SRH, $t(3478) = 2.31$, $p = .011$, B = 0.66, 95% CI [0.19, 1.13]. However, when comparisons were made on the lowest levels of Prayer/Meditation (i.e., “Not at all”), there were no differences between the groups. In general, being Christian

was associated with higher SRH, *but only compared to the non-religious who reported atypically high levels of Prayer/Meditation*.

Block 3 and Block 4 were removed and Spiritual Identity was entered in Block 5, $\Delta R^2 = .002$, $R^2 = .134$, but it was not a significant predictor $t(3479) = 1.20$, $p = .229$. Spiritual Identity was a significant moderator in Block 6, $\Delta R^2 = .002$, $R^2 = .136$ (see Figure 1.1.5). Spiritual Identity moderated Religiosity, $t(3478) = 1.72$, $p = .043$, 95% CI [0.01, 0.27], however Religiosity was not a significant predictor for Non-Spirituals or for Spirituals (see Table 1.1.4).

Follow-up analysis revealed that when Non-Spirituals and Spirituals reported the highest level of Religiosity (i.e., "Very religious"), Spirituals had better SRH, $t(3478) = 2.26$, $p = .012$, B = 0.44, 95% CI [0.12, 0.76]. When compared at the lowest levels of Religiosity, no significant differences emerged between the groups. These results would suggest that Spirituals reported higher SRH than Non-Spirituals, *but only when Non-Spirituals reported atypically high levels of Religiosity*.

In follow-up analysis, it was tested whether R/S constructs would significantly predict SHR in a sample consisting exclusively of the non-religious or Non-Spirituals. In these circumstances, R/S constructs were not significant predictors of SRH.

Study 1.1 Discussion

Study 1.1 established three key findings that support the idea that R/S does not have a uniformly positive relationship with health outcomes. First, it was demonstrated that the relationship between Prayer/Meditation and Religiosity, and health outcomes were often moderated by a person's Religious Identity or Spiritual Identity. In other

words, positive effects associated with these variables were attenuated or reversed when considering R/S Minorities. Second, when the non-religious and Christians, or the Non-Spiritual and Spiritual were compared at the highest levels of these moderated R/S constructs, being a member of a R/S Minority was associated with poorer health. This supports the idea that not only do R/S Minorities report a less positive relationship between R/S constructs and health outcomes, when high levels of R/S constructs *are* reported , this was associated with poorer health. Finally, when only subsamples of the non-religious or Non-Spirituals were considered separately, R/S constructs consistently failed to be significant predictors of health outcomes. All of these findings provide confirmation of the idea that R/S is not uniformly experienced by everyone, and that R/S identities influence the experience of R/S constructs. Study 1.2 will build upon Study 1.1 by combining Religious Identity and Spiritual Identity into a single grouping variable.

Study 1.2

Whereas Religious Identity tended to moderate the health-related effects of Prayer/Meditation in Study 1.1, and Spiritual Identity tended to moderate the health-related effects of Religiosity in Study 1.1, Study 1.2 combined these two identities together (Religious and Spiritual Identity). This decision was made to investigate the additive effect of multiple identities. Study 1.2 produced three regression models that followed an identical template:

Block 1: Demographic covariates were entered.

Block 2: R/S constructs were entered.

Block 3: Religious and Spiritual Identity was entered; the non-religious/Non-Spiritual were the reference group.

Block 4 (stepwise regression): Religious and Spiritual Identity was tested as a potential moderator for Attendance, Prayer/Meditation, and Religiosity in their individual relationships with the outcome variable.

Hypothesis: Moderator terms were predicted to be positive (this is a one-tailed hypothesis). This would support the contention that the non-religious/Non-Spiritual experience R/S constructs less positively than Christian/Spiritual group.

Hypothesis: When compared on the highest levels for any moderated R/S construct, the non-religious/Non-Spiritual are predicted to report lower health than the religious (this is a one-tailed hypothesis). This would support the contention that the non-religious/Non-Spiritual experience higher levels of R/S constructs less positively than the Christian/Spiritual.

Participants

Only persons who were both Christians and Spiritual (Christian/Spiritual), or were non-religious and Non-Spiritual (non-religious/Non-Spiritual) were retained from Study 1.1's dataset. It was reasoned that persons who were both Christian and Spiritual, or non-religious and Non-spiritual would be the strongest group combinations. There were 2546 respondents who fit the aforementioned criteria out of Study 1.1's 3491 respondents. In this sample there were 970 males and 1576 females, with the average age of the respondents falling between 45 and 49 years of age. New Brunswick and Manitoba were represented comparably (NB = 1249 respondents, MB = 1297 respondents). As

expected, Religious and Spiritual Identity was substantially skewed [non-religious/Non-Spiritual (N = 274); Christian/Spiritual (N = 2272)]. See Table 1.2.1 for descriptive statistics.

Results

Emotional Well-Being

Emotional Well-Being (EWB) was regressed onto covariates in Block 1 $F(7, 2538) = 2.95$, $p = .005$, $R^2 = .023$. Religious/Spiritual constructs were entered in Block 2, $\Delta R^2 = .008$, $F(3, 2535) = 2.00$, $p = .113$, $R^2 = .031$, but no R/S constructs were significant predictors. Block 3 inserted Religious and Spiritual Identity, $\Delta R^2 = .000$, $R^2 = .031$, but it was not a significant predictor $t(2534) = -0.33$, $p = .738$, but was non-significant. Block 4 investigated moderator terms $\Delta R^2 = .002$ and had an $R^2 = .033$. Religiosity was moderated by Religious and Spiritual Identity, $t(2533) = 1.73$, $p = .042$, 95% CI [0.02, 0.49]. Neither the non-religious/Non-Spiritual group, nor the Christian/Spiritual group experienced Religiosity significantly (see Figure 1.2.1) (see Table 1.2.2 for this hypothesis' regression model).

When the non-religious/Non-Spiritual group and the Christian/Spiritual group were compared on the highest level of Religiosity (i.e., "Very religious), being a Christian/Spiritual was associated with higher EWB, $t(2533) = 1.75$, $p = .041$, B = 0.75, 95% CI [0.04, 1.44]. When compared on the lowest levels of Religiosity, there were no differences between groups. The Christian/Spiritual group had better EWB than the non-religious/Non-Spiritual group*, but only when the non-religious/Non-Spiritual reported atypically high Religiosity*, $t(423.24) = -49.03$, $p < .001$; $M_{diff} = -1.82$, 95% CI [-1.89, -

1.74]. In a follow-up analysis that only considered the non-religious/Non-Spiritual group, R/S constructs were not significant positive predictors of EWB.

Psychological Well-Being

Psychological Well-Being (PWB) was regressed onto covariates in Block 1 $F(7, 2538) = 1.45$, $p = .181$, $R^2 = .010$. Religious/Spiritual constructs were entered in Block 2, $\Delta R^2 = .002$, $F(3, 2535) = 0.71$, $p = .544$, $R^2 = .012$. None of the R/S constructs significantly predicted PWB. Religious and Spiritual Identity was added in Block 3, $\Delta R^2 = .000$, $R^2 = .012$, but it was not a significant predictor, $t(2534) = -0.04$, $p = .967$. Moderation terms were considered in Block 4, $\Delta R^2 = .004$, $R^2 = .017$. Religious and Spiritual Identity moderated Religiosity $t(2533) = 1.93$, $p = .027$, 95% CI [0.06, 0.68]. Religiosity was not a significant predictor of PWB for either the Christian/Spiritual group or the non-religious/Non-Spiritual group (see Figure 1.2.2) (see Table 1.2.3 for this hypothesis' regression model).

In the follow-up analysis, Religious and Spiritual Identity predicted better PWB for the highest level of Religiosity (i.e., "Very religious"), $t(2533) = 1.86$, $p = .032$, B = 1.15, 95% CI [0.13, 2.16]. When compared on the lowest level of Religiosity (i.e., "Not religious at all"), there were no differences between groups. In other words, the Christian/Spiritual group was healthier than the non-religious/Non-Spiritual group, but only when compared on the highest levels of Religiosity. In a follow-up analysis that only considered the non-religious/Non-Spiritual group, R/S constructs were not significant positive predictors of PWB.

Self-Rated Health

Self-Rated Health (SRH) was regressed onto covariates in Block 1 $F(7, 2538) = 31.13$, $p < .001$, $R^2 = .150$. Religious/Spiritual constructs were entered in Block 2 $\Delta R^2 = .004$ $F(3, 2535) = 1.51$, $p = .209$, $R^2 = .154$. Attendance significantly predict SRH, $t = 2.10$, $p = .036$, 95% CI [0.01, 0.15], while Prayer/Meditation and Religiosity were not significant predictors. Religious and Spiritual Identity was entered in Block 3, $\Delta R^2 = .004$, $R^2 = .031$, but it was not a significant predictor $t(2534) = 1.71$, $p = .088$, but was not a significant predictor. A stepwise regression model in Block 4 revealed no significant interaction terms (see Table 1.2.4 for this hypothesis' regression model). In a follow-up analysis that only considered the non-religious/Non-Spiritual group, R/S constructs were not significant positive predictors of SRH.

Study 1.2 Discussion

Similar to Study 1.1, Study 1.2 confirmed that members of a R/S Minority may experience R/S constructs less positively than those in a R/S Majority. Additionally, health differences on the basis of group identity only emerged when the highest levels of R/S constructs were assessed. Moreover, when subsamples of only the non-religious/Non-Spiritual group were considered, R/S constructs were not significant predictors of any health outcomes. All three of these ideas illustrate the underlying contention of this study; benefits associated with R/S constructs are not uniformly experienced by R/S Majorities and R/S Minorities.

Discussion

Study 1.1 and Study 1.2 both found that the relationship between R/S constructs and health was often moderated by Religious Identity, Spiritual Identity, or Religious and Spiritual Identity. These findings illustrate the importance of examining the role of R/S identities when investigating the experience of R/S constructs on Emotional Well-Being (EWB), Psychological Well-Being (PWB), and Self-Rated Health (SRH). At least one moderation term was significant for all three regression models involving EWB, two regression models involving PWB, and two regression models involving SRH. Moreover, not only did R/S Minority groups experience R/S constructs less positively, when R/S Majorities and R/S Minorities were compared at the highest levels of moderated R/S constructs, R/S Minorities reported poorer health in every circumstance.

The current study used a large, general sample that would have had a high degree of intragroup variability. This heterogeneity in part explains the small effect sizes associated with nearly every regression block in both Study 1.1 and Study 1.2. Even in circumstances of investigating demographic covariates (Block 1), there was only one situation in which the variance explained exceeded 5% (Study 1.1, SRH). While significant moderation terms appeared as predicted, the effect size associated with these changes was fairly weak in an absolute sense. While it is tempting to dismiss the higher order effects as spurious, it is informative to note that the pattern of moderation was consistent with the hypotheses, suggesting the effects were non-random. Moreover, the R^2 associated with the included moderation terms either matched or exceeded the variance accounted for by Block 2 (R/S constructs) 3/7 times. So while the effect size

observed within the data was not high in an absolute sense, it was often comparable to the effect sizes for R/S constructs (which have a well-established literature regarding the prediction of health outcomes). Moreover, given that R/S Minorities tended to report significantly poorer health than R/S Majorities on the highest levels of moderated R/S constructs, these group differences are arguably important.

Within Study 1.1 and Study 1.2, R/S constructs were only sporadically related to better health.. Granted, Attendance appeared to positively predict health outcomes reasonably consistently (Attendance was significant in 4/6 times in Block 2), which is aligned with previous research (Ellison et al., 2001; Levin & Chatters, 1998). However, Religiosity was not predictive of health (0/6 times in Block 2) and Prayer/Meditation was rarely predictive of health (1/6 times in Block 2). Part of the non-significance of many of the R/S constructs may be attributable to the usage of robust standard errors – a practice that is rare within much of the Religion/Spirituality-health literature. However, when only subsamples of R/S Minorities were considered, none of the R/S constructs positively predicted health outcomes. These results do not discredit previous research, but instead suggest that R/S constructs are not generalizable to R/S Minority populations.

Limitations

Both the Religious Identity and Spiritual Identity variables represented a relatively weak grouping variable for the current study. Moreover, because New Brunswick and Manitoba have different sociocultural factors and histories, Christians in one province may not necessarily be equivalent of Christians in the other province. While efforts to control for homogeneity were made (see Appendix C), this should not be

interpreted to mean that Christians from these two provinces are necessarily equivalent. An additional issue was the absence of extensive covariate control, which made it difficult to determine the robustness of the observed moderation effects. Study 2 will examine similar research questions to Study 1 and will have access to a wider battery of covariates.

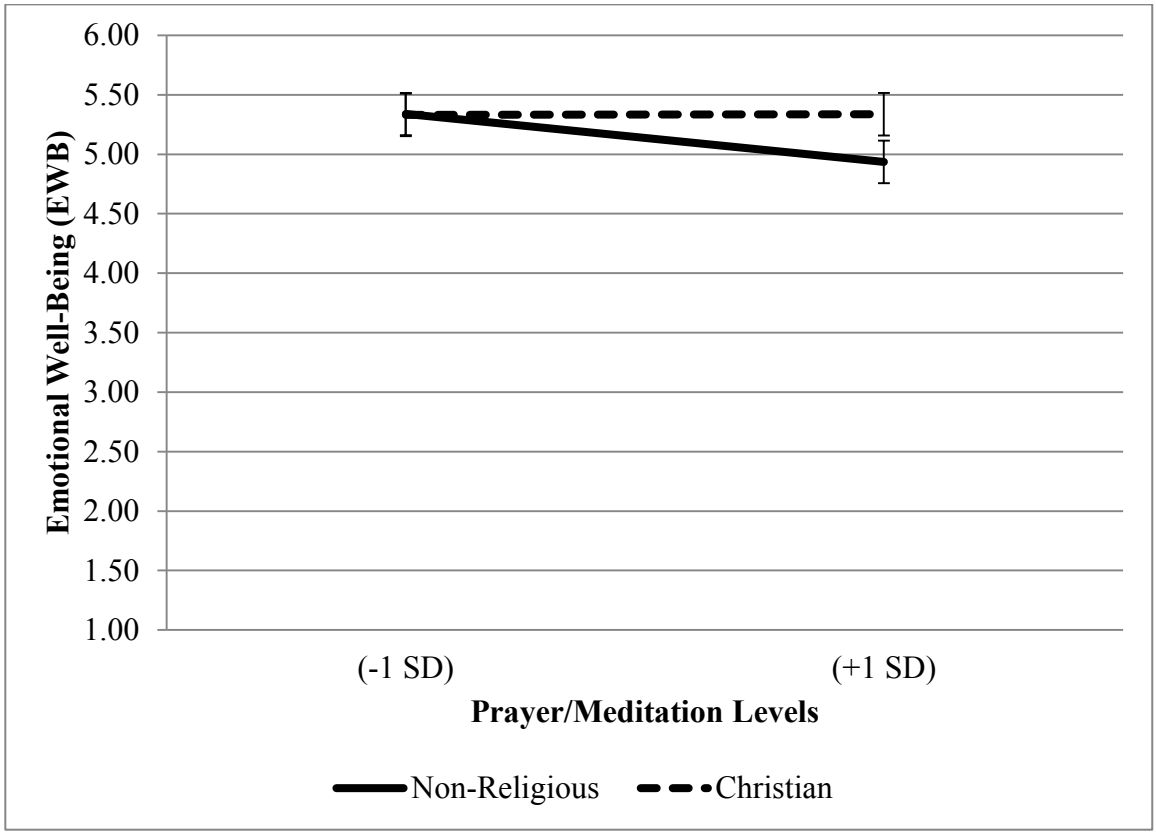

Figure 1.1.1. Religious Identity Moderates the Experience of Prayer/Meditation in the Prediction of Emotional Well-Being.

Note: Values were mean centered. Error bars represent 95% confidence intervals.

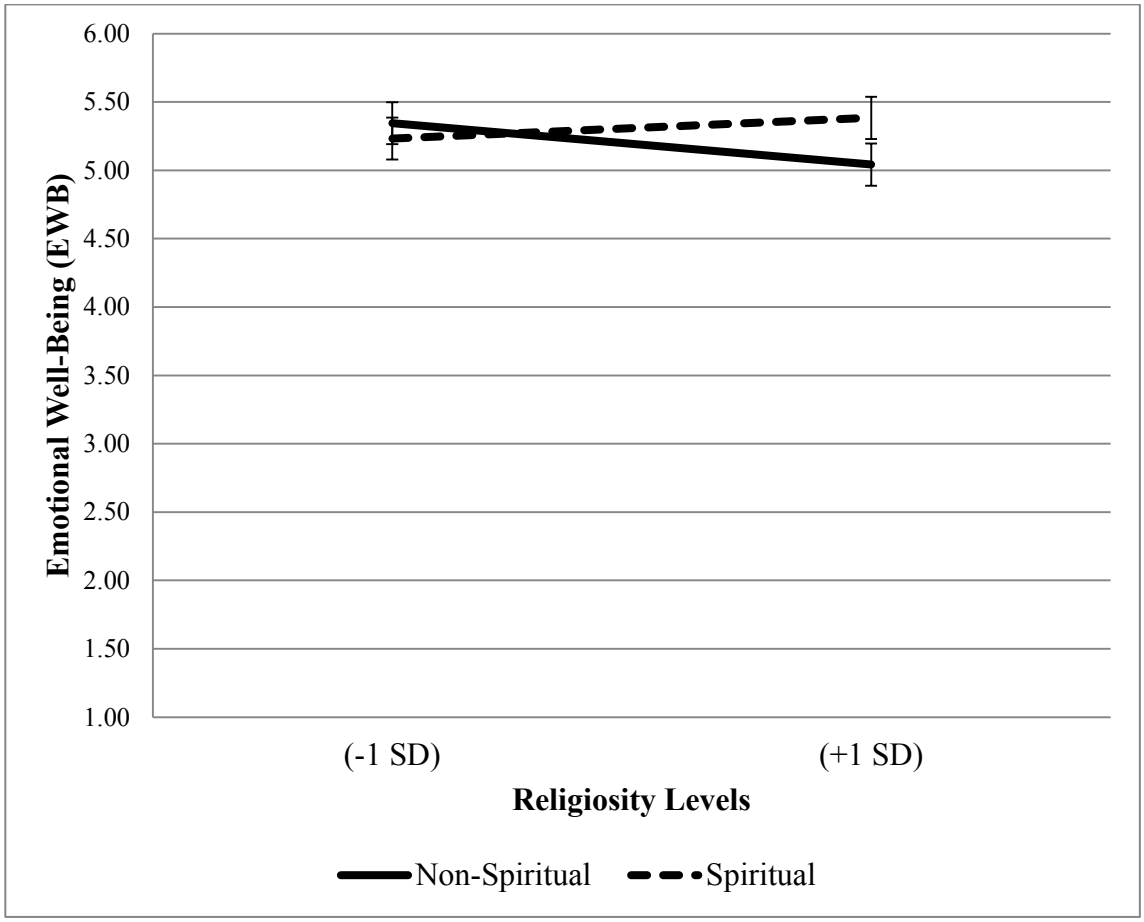

Figure 1.1.2. Spiritual Identity Moderates the Experience of Religiosity in the Prediction of Emotional Well-Being.

Note: Values were mean centered. Error bars represent 95% confidence intervals.

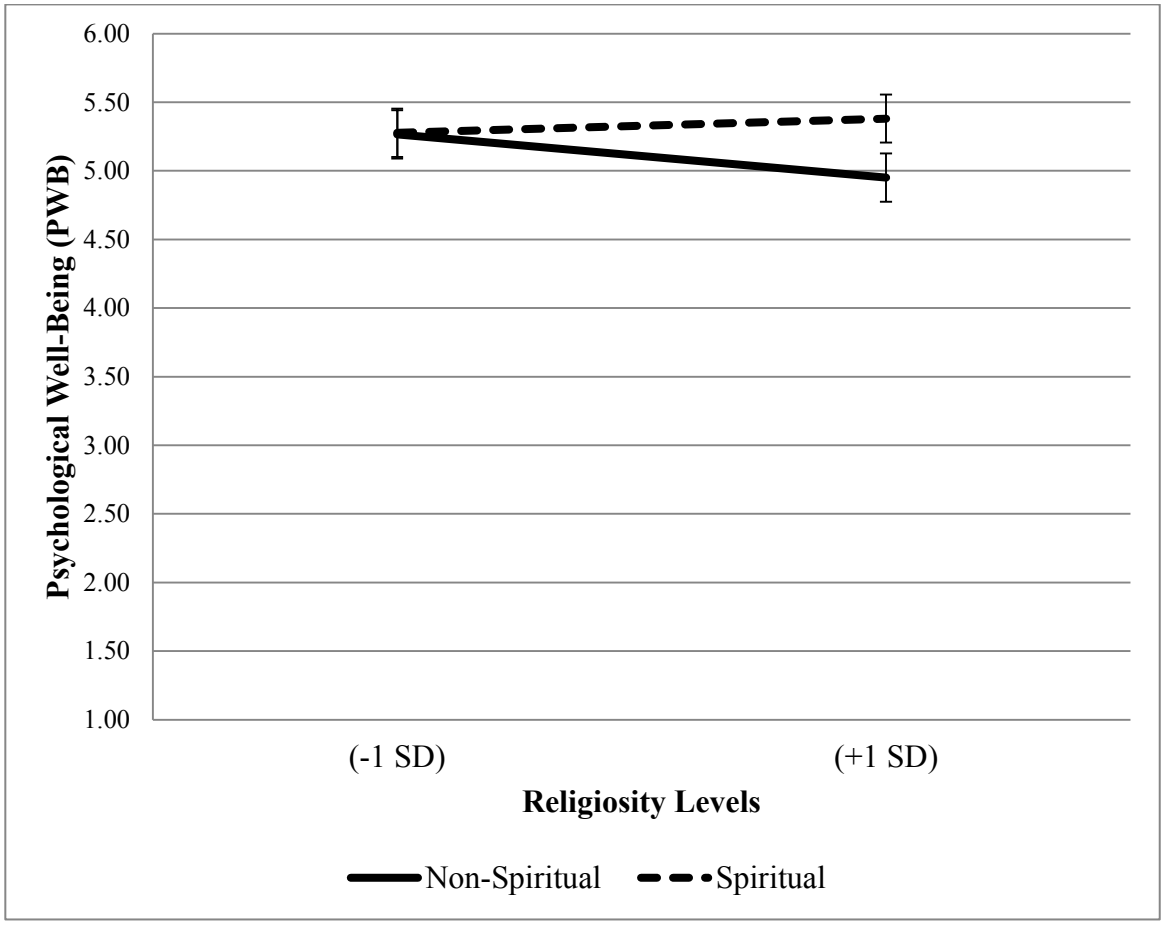

Figure 1.1.3. Spiritual Identity Moderates the Experience of Religiosity in the Prediction of Psychological Well-Being.

Note: Values were mean centered. Error bars represent 95% confidence intervals.

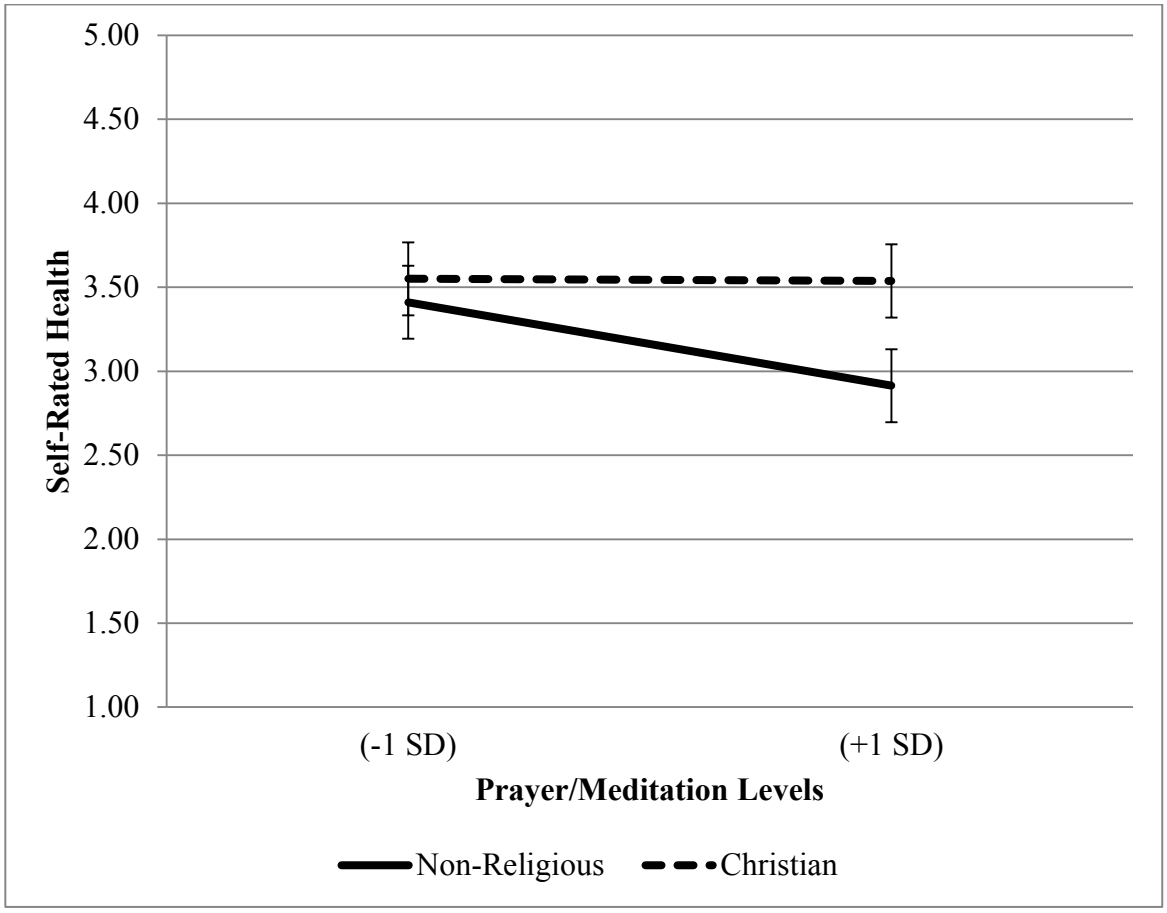

Figure 1.1.4. Religious Identity Moderates the Experience of Prayer/Meditation in the Prediction of Self-Rated Health.

Note: Values were mean centered. Error bars represent 95% confidence intervals.

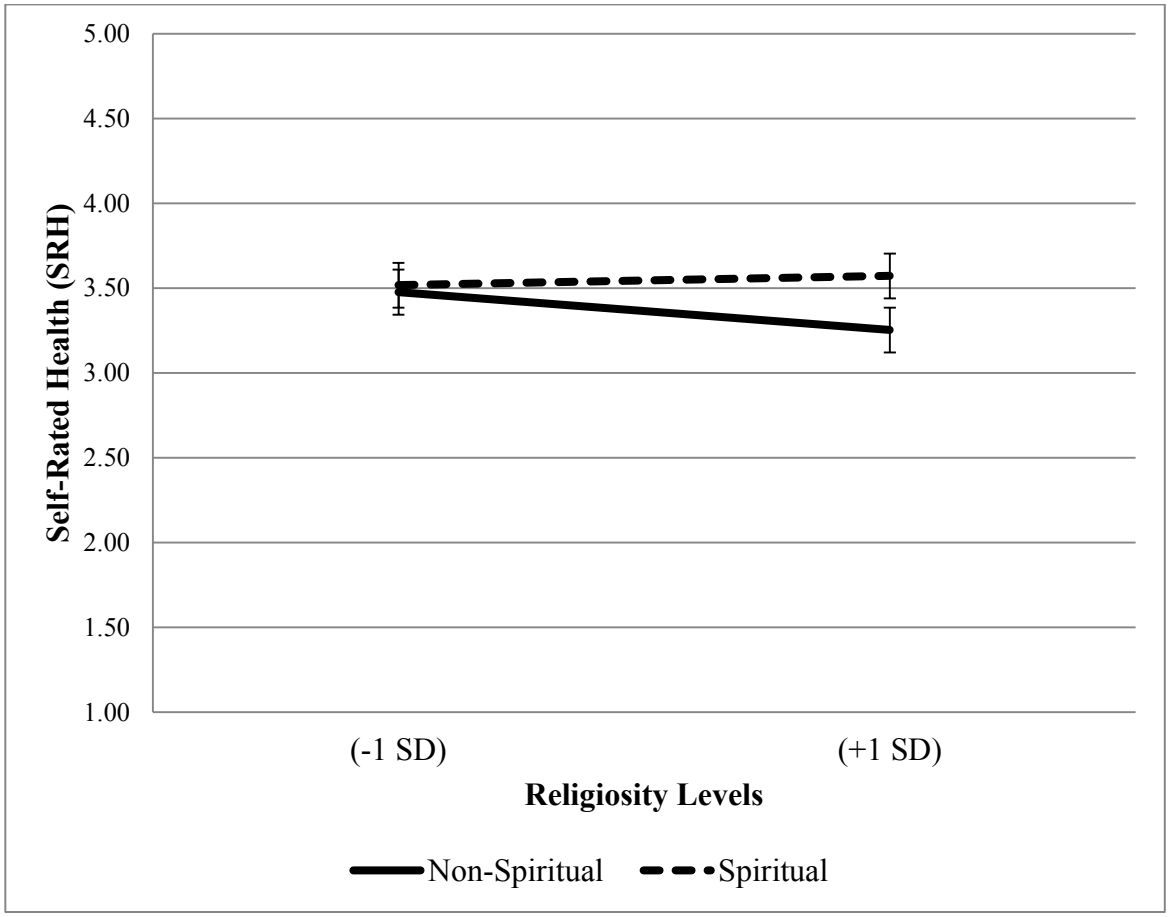

Figure 1.1.5. Spiritual Identity Moderates the Experience of Religiosity in the Prediction of Self-Rated Health.

Note: Values were mean centered. Error bars represent 95% confidence intervals.

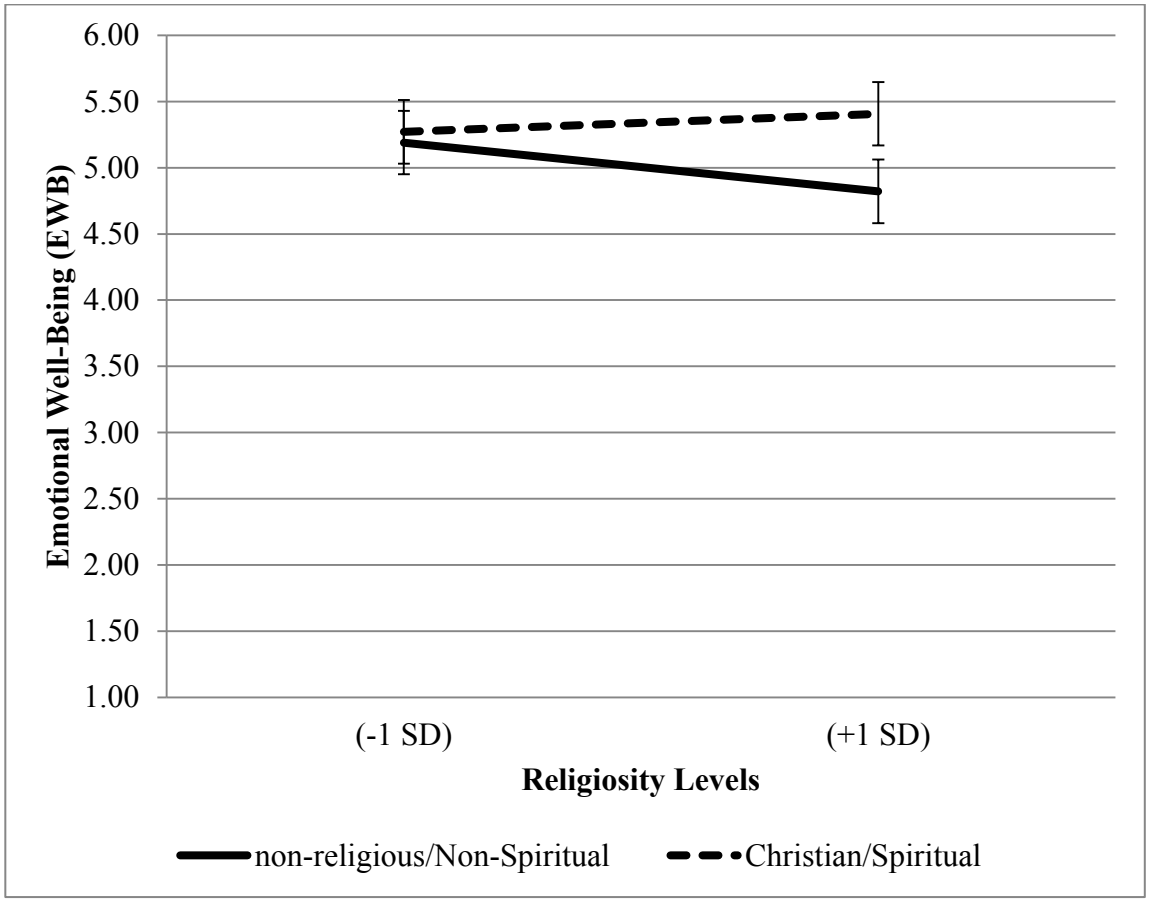

Figure 1.2.1. Religious and Spiritual Identity Moderates the Experience of Religiosity in the Prediction of Emotional Well-Being.

Note: Values were mean centered. Error bars represent 95% confidence intervals.

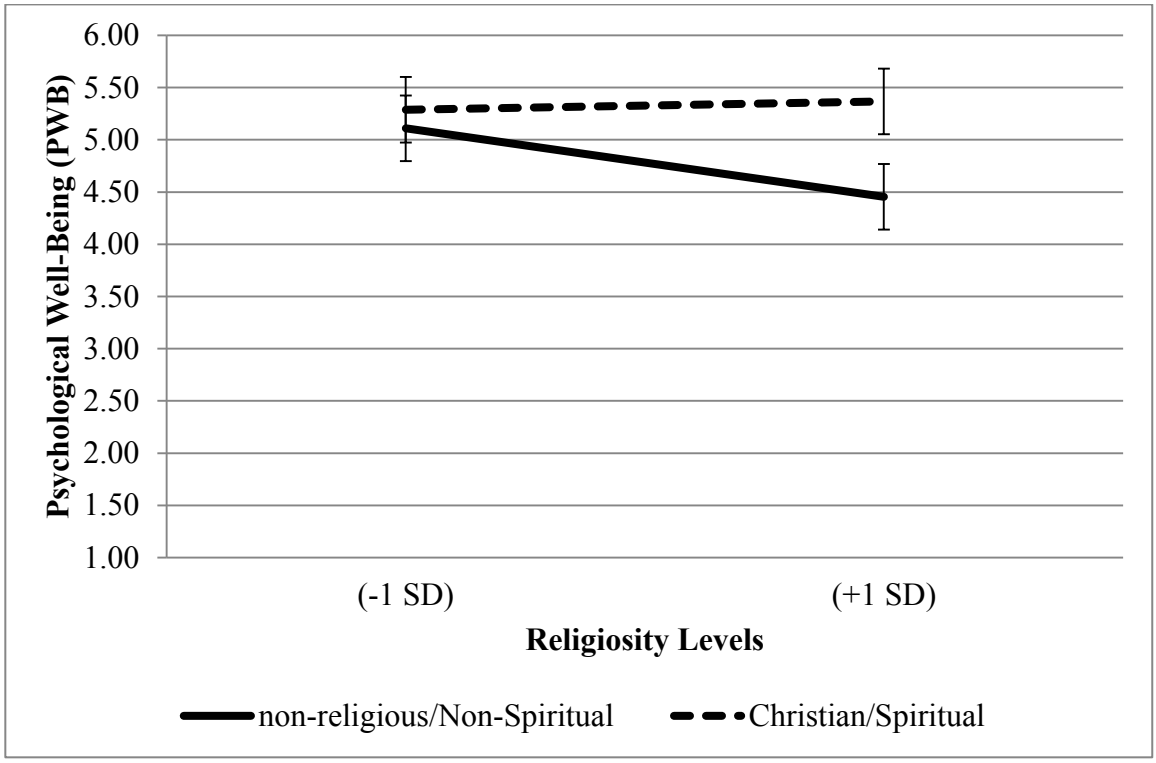

Figure 1.2.2. Religious and Spiritual Identity Moderates the Experience of Religiosity in the Prediction of Psychological Well-Being.

Note: Values were mean centered. Error bars represent 95% confidence intervals.

Table 1.1.1

Uncentered Means and Standard Deviations for Study 1.1

	All		Non-Religious		Christian		Non-Spiritual		Spiritual	
	M	SD	M	SD	M	SD	M	SD	M	SD
EWB	5.33	0.73	5.23	0.80	5.34	0.72	5.27	0.76	5.36	0.72
PWB	5.31	0.70	5.23	0.79	5.32	0.69	5.24	0.78	5.35	0.66
SRH	3.52	1.00	3.54	1.03	3.52	1.00	3.54	1.00	3.52	1.00
Sex	0.57	0.50	1.46	0.50	1.58	0.49	1.42	0.49	1.64	0.48
Age	6.86	3.41	4.93	3.15	7.10	3.37	5.84	3.39	7.34	3.31
Partner (No Partner)	0.60	0.49	0.48	0.50	0.61	0.49	0.56	0.50	0.62	0.49
Minority (White)	0.10	0.30	0.16	0.37	0.09	0.29	0.09	0.29	0.10	0.30
Education	3.00	1.23	3.14	1.12	2.98	1.24	3.01	1.18	2.99	1.25
Income	3.31	1.39	3.62	1.33	3.27	1.40	3.52	1.35	3.21	1.41
Region (NB)	0.51	0.50	0.73	0.44	0.49	0.50	0.58	0.49	0.49	0.50
Attend	2.67	1.63	1.32	0.75	2.84	1.63	1.47	0.88	3.23	1.59
Pray	3.76	2.11	1.93	1.69	3.98	2.05	1.83	1.52	4.66	1.70
Religiosity	2.41	0.89	1.33	0.59	2.54	0.83	1.63	0.66	2.77	0.74
N =	3491		377		3114		1116		2375	

Note: EWB = Emotional Well-Being, PWB = Psychological Well-Being, SRH = Self-Rated Health. Parenthesized words indicate which categorical level was the lowest.

Table 1.1.2

Regression Model Predicting Emotional Well-Being Using Religious Identity and Spiritual Identity as Moderators

	Unstandardized B Coefficient/Robust Standard Error					
	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	.000/.028	.000/.029	-.031/.096	-.193/.104†	.000/.061	-.136/.085
Sex (Male)	-.048/.057	-.058/.057	-.058/.057	-.056/.057	-.058/.057	-.061/.057
Age	.021/.028	.007/.029	.006/.029	.005/.028	.007/.029	.007/.028
Minority (White)	-.064/.105	-.081/.107	-.079/.108	-.073/.107	-.081/.108	-.064/.107
Partner (Single)	.245/.074**	.232/.075**	.231/.075**	.230/.075**	.232/.076**	.232/.074**
Education	-.007/.030	-.013/.029	-.013/.029	-.013/.029	-.013/.029	-.012/.029
Income	.097/.034**	.101/.035**	.100/.035**	.101/.034**	.101/.035**	.107/.034**
Province (NB)	-.034/.058	-.040/.059	-.038/.058	-.039/.058	-.040/.059	-.055/.057
Attend		.084/.039*	.084/.039*	.076/.039†	.084/.039*	.064/.040
Pray/Med.		-.019/.044	-.019/.044	-.202/.100*	-.019/.044	.020/.043
Religiosity		.004/.046	-.001/.047	-.006/.047	.004/.050	-.152/.084†
Rel.ID (NR)			.035/.102	.197/.109†		
Rel.ID*Prayer				.204/.109*		
Spr. ID (N.Spr)					.001/.088	.114/.097
Spr.ID*Religiosity						.227/.094**
R^2/ ΔR^2	.033/.033***	.038/.006	.038/.000	.041/.003†	.038/.000	.045/.006*

Note: Rel.ID = Religious Identity, Spr.ID = Spiritual Identity, NR = Non-Religious, N.Spr = Non-Spiritual, Pray/Med.= Prayer/Meditation. Variables are centered (except identity variables). Continuous variables are standardized. Parenthesized words indicate lowest categorical level.

† p <.10, * p <.05, ** p <.01, *** p <.001

Table 1.1.3

Regression Model Predicting Psychological Well-Being Using Religious Identity and Spiritual Identity as Moderators

	Unstandardized B Coefficient/Robust Standard Error					
	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	.000/.030	.000/.030	.051/.101		-.076/.073	-.202/.105†
Sex (Male)	-.004/.060	-.050/.060	-.049/.060		-.052/.061	-.054/.060
Age	.004/.028	-.018/.029	-.016/.029		-.021/.029	-.021/.029
Minority (White)	-.086/.105	-.120/.104	-.123/.105		-.126/.105	-.110/.103
Partner (Single)	.129/.076†	.119/.076	.120/.076		.113/.076	.113/.075
Education	.025/.031	.021/.030	.021/.030		.020/.030	.020/.030
Income	.059/.035†	.066/.035†	.067/.034†		.065/.034†	.071/.033*
Province (NB)	-.042/.062	-.035/.062	-.039/.061		-.037/.061	-.050/.059
Attend		.000/.040	.001/.040		-.005/.041	-.023/.043
Pray/Med.		.091/.044*	.092/.044*		.071/.045	.070/.044
Religiosity		-.001/.044	.007/.045		.015/.048	-.158/.097
Rel.ID (NR)			-.059/.109			
Spr. ID (N.Spr)					.116/.102	.221/.118†
Spr.ID*Religiosity						.209/.107*
R^2/ ΔR^2	.013/.013*	.020/.007*	.020/.000		.022/.002	.027/.006*

Note: Rel.ID = Religious Identity, Spr.ID = Spiritual Identity, NR = Non-Religious, N.Spr = Non-Spiritual, Pray/Med.= Prayer/Meditation. Variables are centered (except identity variables). Continuous variables are standardized. Parenthesized words indicate lowest categorical level.

† p <.10, * p <.05, ** p <.01, *** p <.001

Table 1.1.4

Regression Model Predicting Self-Rated Health Using Religious Identity and Spiritual Identity as Moderators

	Unstandardized B Coefficient/Robust Standard Error					
	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	.000/.027	.000/.027	-.165/.093†	-.358/.148*	-.072/.061	-.155/.074*
Sex (Male)	.130/.055*	.128/.053*	.124/.053*	.127/.053*	.127/.053*	.125/.053*
Age	-.158/.027***	-.167/.028***	-.174/.028***	-.174/.028***	-.169/.028***	-.169/.028***
Minority (White)	-.225/.091*	-.235/.091*	-.224/.091*	-.217/.090*	-.241/.092**	-.230/.091*
Partner (Single)	.000/.066	-.010/.065	-.013/.064	-.015/.063	-.016/.066	-.015/.065
Education	.093/.029**	.088/.029**	.088/.029**	.088/.029**	.087/.029**	.087/.029**
Income	.225/.033***	.228/.033***	.224/.033***	.225/.032***	.227/.033***	.231/.033***
Province (NB)	.136/.056*	.130/.055*	.141/.056*	.140/.055*	.129/.055*	.120/.055*
Attend		.082/.035*	.081/.035*	.073/.035*	.078/.035*	.066/.034*
Pray/Med.		-.031/.039	-.033/.039	-.248/.129†	-.050/.042	-.051/.041
Religiosity		-.004/.041	-.029/.040	-.036/.040	-.017/.045	-.112/.066†
Rel.ID (NR)			.191/.100†	.382/.152*		
Rel.ID*Prayer				.242/.132*		
Spr. ID (N.Spr)					.110/.091	.180/.092†
Spr.ID*Religiosity						.139/.081*
R^2/ ΔR^2	.128/.128***	.132/.004†	.136/.003†	.140/.004*	.134/.002	.136/.002*

Note: Rel.ID = Religious Identity, Spr.ID = Spiritual Identity, NR = Non-Religious, N.Spr = Non-Spiritual, Pray/Med.= Prayer/Meditation. Variables are centered (except identity variables). Continuous variables are standardized. Parenthesized words indicate lowest categorical level.

† p <.10, * p <.05, ** p <.01, *** p <.001

Table 1.2.1

Uncentered Means and Standard Deviations for Study 1.2

	All		non-religious/Non-Spiritual		Christian/Spiritual	
	M	SD	M	SD	M	SD
EWB	5.35	0.73	5.23	0.81	5.36	0.72
PWB	5.33	0.68	5.21	0.83	5.35	0.66
SRH	3.52	1.00	3.56	1.01	3.52	1.00
Sex	1.62	0.49	1.42	0.50	1.64	0.48
Age	7.13	3.41	4.71	3.23	7.43	3.31
Partner (No Partner)	0.61	0.49	0.49	0.50	0.62	0.48
Minority (White)	0.10	0.30	0.15	0.35	0.10	0.30
Education	2.99	1.24	3.09	1.12	2.98	1.25
Income	3.26	1.40	3.73	1.29	3.20	1.41
Region (NB)	0.51	0.50	0.77	0.42	0.48	0.50
Attend	3.09	1.63	1.23	0.65	3.31	1.57
Pray	4.35	1.92	1.32	0.94	4.71	1.66
Religiosity	2.66	0.83	1.24	0.48	2.83	0.69
N =	2546		274		2272	

Note: EWB = Emotional Well-Being, PWB = Psychological Well-Being, SRH = Self-Rated Health. Parenthesized words indicate which categorical level was the lowest.

Table 1.2.2

Regression Model Predicting Emotional Well-Being Using Religious and Spiritual Identity as a Moderator

	Unstandardized B Coefficient/Robust Standard Error			
	Block 1	Block 2	Block 3	Block 4
Constant	.000/.034	.000/.034	.037/.114	-.342/.204
Sex (Male)	-.068/.067	-.067/.066	-.066/.066	-.067/.065
Age	.024/.031	.012/.032	.013/.032	.014/.032
Minority (White)	-.085/.121	-.087/.125	-.088/.125	-.073/.127
Partner (Single)	.173/.084*	.151/.086†	.153/.087†	.152/.087†
Education	-.005/.038	-.011/.037	-.011/.037	-.011/.037
Income	.085/.037*	.093/.037*	.094/.037*	.096/.037*
Province (NB)	-.080/.067	-.092/.065	-.094/.065	-.100/.065
Attend		.084/.044†	.084/.044†	.079/.044†
Pray/Med.		-.066/.048	-.062/.049	-.064/.049
Religiosity		.046/.053	.052/.054	-.184/.138
Rel./Spr.ID (NR/N.Spr)			-.042/.127	.334/.213
Rel./Spr.ID*Religiosity				.252/.148*
R^2/ ΔR^2	.023/.023**	.031/.008	.031/.000	.033/.002*

Note: Rel./Spr.ID = Religious and Spiritual Identity, NR/N.Spr = non-religious/Non-Spiritual. Variables are centered (except identity variables). Continuous variables are standardized. Parenthesized words indicate lowest categorical level.

† p <.10, * p <.05, ** p <.01, *** p <.001

Table 1.2.3

Regression Model Predicting Psychological Well-Being Using Religious and Spiritual Identity as a Moderator

	Unstandardized B Coefficient/Robust Standard Error			
	Block 1	Block 2	Block 3	Block 4
Constant	.000/.033	.000/.033	.005/.121	-.549/.315†
Sex (Male)	.007/.067	-.017/.067	-.017/.067	-.018/.067
Age	-.007/.031	-.018/.032	-.018/.033	-.017/.032
Minority (White)	-.119/.118	-.136/.116	-.136/.116	-.115/.116
Partner (Single)	.055/.080	.051/.082	.051/.083	.050/.083
Education	.066/.036†	.064/.036†	.064/.036†	.064/.036†
Income	-.004/.037	.003/.037	.003/.036	.005/.036
Province (NB)	-.107/.065	-.103/.064	-.104/.065	-.112/.065†
Attend		-.020/.047	-.020/.047	-.027/.047
Pray/Med.		.052/.047	.053/.049	.050/.049
Religiosity		.015/.045	.015/.048	-.328/.186†
Rel./Spr.ID (NR/N.Spr)			-.005/.135	.544/.323†
Rel./Spr.ID*Religiosity				.369/.193*
R^2/ ΔR^2	.010/.010	.012/.002	.012/.000	.017/.004*

Note: Rel./Spr.ID = Religious and Spiritual Identity, NR/N.Spr = non-religious/Non-Spiritual. Variables are centered (except identity variables). Continuous variables are standardized. Parenthesized words indicate lowest categorical level.

† p <.10, * p <.05, ** p <.01, *** p <.001

Table 1.2.4

Regression Model Predicting Self-Rated Health Using Religious and Spiritual Identity as a Moderator

	Unstandardized B Coefficient/Robust Standard Error			
	Block 1	Block 2	Block 3	Block 4
Constant	.000/.031	.000/.031	-.210/.124†	
Sex (Male)	.084/.063	.085/.061	.082/.061	
Age	-.195/.031***	-.200/.033***	-.209/.032***	
Minority (White)	-.219/.107*	-.226/.107*	-.225/.107*	
Partner (Single)	-.011/.071	-.019/.071	-.030/.069	
Education	.071/.035*	.067/.035†	.066/.035†	
Income	.254/.036***	.253/.037***	.248/.037***	
Province (NB)	.116/.062†	.109/.063†	.122/.064†	
Attend		.079/.038*	.081/.037*	
Pray/Med.		-.029/.041	-.052/.045	
Religiosity		-.022/.045	-.056/.049	
Rel./Spr.ID (NR/N.Spr)			.241/.142†	
Rel./Spr.ID*Attend				
Rel./Spr.ID*Pray/Med.				
Rel./Spr.ID*Religiosity				
R^2/ ΔR^2	.023/.023***	.031/.008	.031/.004†	

Note: Rel./Spr.ID = Religious and Spiritual Identity, NR/N.Spr = non-religious/Non-Spiritual. Variables are centered (except identity variables). Continuous variables are standardized. Parenthesized words indicate lowest categorical level.

† p <.10, * p <.05, ** p <.01, *** p <.001

Study 2: Testing the Robustness of Religious Identity as a Moderator

Within the Religion/Spirituality-health literature there is a tendency for studies to explore the effects of R/S constructs (Attendance, Prayer/Meditation, and Religiosity) on health outcomes, without controlling for the influence of covariates. While it is impossible for any one study to control for *all* covariates, it is often the case that researchers will fail to appreciate how diffuse health outcomes are. Specifically, R/S constructs (Attendance, Prayer/Meditation, and Religiosity) are linked to social support and mastery, and both of these are linked to health outcomes.

Social Support

Social support (i.e., the size, quality, and satisfaction with one's group) has a well-documented relationship in the promotion of health outcomes (e.g., Fowler, Wareham-Fowler, & Barnes, 2013; Powell, Shahabi, & Thoresen, 2003). Problematically for researchers, persons reporting higher levels of Attendance (Koenig & Hays, 1999; Koenig et al., 1998; Strawbridge et al., 1997; Strawbridge et al., 2001) and Religiosity (Cotton et al., 2006; Horning et al., 2011) report higher levels of social support. Because these R/S constructs are linked to social support (which promotes health), social support represents a natural confound with Religion/Spirituality-health research. Essentially, it is difficult to discern whether Attendance and Religiosity promote health, or if Attendance and Religiosity promote social support and social support promotes health.

While research addressing R/S and health encompasses many different studies, social support is infrequently controlled for (Baker & Cruickshank, 2009; Basiński, Stefaniak, Stadnyk, Sheikh, & Vingerhoets, 2013; Frankel & Hewitt, 1994; Gauthier et

al., 2006; Harris et al., 2006; Harris et al., 2008; Krause, 2010; Krause & Hayward, 2012; Kuentzel et al., 2012; Lonczak, Clifasefi, Marlat, Blume & Donovan, 2006; Morris & McAdie, 2009; Yohannes et al., 2008). While some studies may use minimal demographic information (e.g. marital status) as a social support control (Benjamins et al., 2006; Benjamins & Brown, 2004; Ellison et al., 2011; Galek et al., 2007; Koenig, 1995; Krause, 1998; Krause, 2003b; Krause, 2005; Krause, 2006; Krause & Wulff, 2004; Levin & Chatters, 1998; Maiello, 2005; Maselko & Buka, 2008; Masters & Knestel, 2011; Matheis, Tulsky, & Matheis, 2006; Mochon et al., 2011; Park et al., 2013; Stack & Kposowa, 2011), this is not an adequate control for the complexity of social support.

Mastery

Mastery (or locus of control, autonomy) describes the extent to which a person believes he/she has control over his/her life. Like social support, mastery is positively associated with a variety of health outcomes (Ben-Shlomo & Taubman-Ben-Ari, 2012; Byma, Given, Given, & You, 2009; Gibson et al., 2011; Hinnen, Ranchor, Baas, Sanderman, & Hagedoorn, 2009; Krokavcova et al., 2008; Spencer & Patrick, 2009), with higher levels of mastery indicating greater levels of health. Conceptually, these findings make sense as they indicate a person with higher levels of autonomy would report greater degrees of health. Logically, healthier people report a greater range of *ability* to exercise control in their lives.

While studies routinely link R/S to mastery (or related constructs), the directionality of this relationship is often complex (e.g., Fiori, Brown, Cortina, & Antonucci, 2006). Occasionally, studies will find that higher levels of R/S or R/S

constructs are associated with greater levels of mastery (Ai, 2005; Gall, 2003; Jang, Borenstein-Graves, Haley, Small, & Mortimer, 2003). Conversely, other studies will find relationships that are not positive (Ai, Peterson, Rodgers, & Tice, 2005; Greenfield, Vaillant, & Marks, 2009; Oates, 2013; Schieman, Nguyen, & Elliott, 2003). Part of the confusion within the literature may stem from the idea that persons will indicate that they feel empowered because of their ability to rely on God (Ai et al., 2005; McCullough & Willoughby, 2009; Ryan & Francis, 2012). This provides confusion to the traditional understanding of mastery, as people may feel vicarious empowerment rather than direct empowerment. Interestingly, the health consequences of relying on a deity appear to be mixed, with some research indicating positive effects (Nairn & Merluzzi, 2003; Pargament et al., 2004) and other research indicating negative effects (Karvinen & Carr, 2014). In summary, while extant research has established a relationship between R/S and mastery, the exact nature of that relationship appears to be varied. Regardless of whether this relationship is positive or negative, it is clear that mastery is both related to health outcomes and is influenced by R/S and R/S constructs. Because of this, it is an important covariate to control.

The goal of Study 2 was to replicate Study 1, while accounting for a greater range of covariates. While Religious Identity did moderate the relationship between R/S constructs and health outcomes in Study 1, that investigation only controlled for demographic covariates. If the relationship between R/S constructs and health outcomes is attributable to other variables, it is possible that the same is true of Religious Identity acting as a moderator. In Study 2, moderation terms were tested with only basic

demographic covariates, and were then tested for a second time with the inclusion of additional covariates for social support and mastery. With the addition of these covariates, moderation terms were less likely to be spurious or attributable to another construct. Like in Study 1, outcome variables selected in Study 2 (Happiness, Self-Rated Health, and Satisfaction with Life) were chosen because of their established positive relationship with Attendance and Religiosity (Diener & Clifton, 2002; Gauthier et al., 2006; Green & Elliot, 2010; Krause, 2003b, Krause, 2005; Okulicz-Kozaryn, 2010; Matheis et al., 2006; Park et al., 2013).

Method

Data Source

The 2008 Canadian General Social Survey Cycle 22: Social Networks dataset was accessed via Memorial University of Newfoundland's library services (catalogue no. 12M0022X). These data were collected between February and November 2008 over all Canadian provinces. Contact was made through random digit dialling banks and survey administrators used Computer Assisted Telephone Interviewing for the data collection. Respondents had to be 15 years or older, speak either English or French, and were not allowed to answer the survey through a proxy. Although institutionalized persons and residents of the Canadian territories were excluded, and economically disadvantaged persons were less likely to respond, the survey was thought to represent ~92% of Canadians (Social and Aboriginal Statistics Division, 2010). However, with participatory exclusions (see following paragraph), the dataset represents less than 92% of the Canadian population.

Participants

To be included within current study, respondents had to answer all questions. Respondents who answered a question with "I don't know" to any item were excluded from the dataset. Additionally, only Christians and the non-religious who were 20 years of age or older were included within the study (see rationale from Study 1). Because of heterogeneity within the Religious Identity measure, New Brunswick, Quebec, and British Columbia were excluded from analyses (see Appendix C).The exclusion of these provinces was to reduce intragroup variability. After these provinces were excluded, there were 8253 respondents who fit the described criteria (3641 male, 4612 female), with the average age of the respondents falling between 45 and 49 years of age. Religious Identity was skewed towards persons identifying as Christian [non-religious = 1776 (21.52%); Christian = 6477 (78.48%)]. See Table 2.1 for the descriptive statistics.

Survey Items

Demographics. Numerous demographic items were used: sex (male/female), age [20-24, 25-29, etc. (5 year intervals)], highest education level of respondent (No schooling/elementary school, some high school, high school completion, some college/university/technical school, college/university/technical school completion, and graduate school), household income (12 levels ranging from "No income" to "$100 000+"), marital status [no partner/partner (including common-law)], race (white/non-white), and province.

R/S constructs. A five-point item regarding church Attendance ("Other than on special occasions, (such as weddings, funerals or baptisms), how often did you attend

religious services or meetings in the past 12 months?"), a five-point item regarding Prayer/Meditation ("In the past 12 months, how often did you practice religious or spiritual activities on your own? This may include prayer, meditation and other forms of worship taking place at home or in any other location."), and a four-point item regarding perceived Religiosity ["How important are your religious or spiritual beliefs to the way you live your life? Would you say they are: very important, somewhat important, etc.?")]. Responses were coded so that higher scores indicated greater levels of Attendance, Prayer/Meditation, and Religiosity respectively.

Social support. There were seven items that were related to social support, including items related to network size (number of close friends, number of neighbours known, number of secular organizations one belongs to, number of new people met outside of work/school in past month), frequency of contact (frequency of seeing friends), and satisfaction with communication (for both friends and relatives).

Mastery. The 2008 Canadian General Social Survey included a mastery index based on the work of Pearlin and Schooler (1978), with higher scores indicating greater level of Mastery. The Pearlin and Schooler Mastery index consists of seven questions (e.g., "Do you sometimes feel pushed around in life?"), and each question is assessed on a five-point scale (Cronbach's $\alpha = .754$). Mastery was coded so that greater scores indicated greater levels of Mastery.

Religious Identity. One item was used to assess Religious Identity. Persons who identified as part of the Non-Religious group were classified as non-religious, while persons who identified as being a part of a Christian groups (i.e., Roman Catholic, United

Church, or Protestant) were classified as "Christian". It should be noted that Christians likely differed from province to province (as did the non-religious). While efforts were undertaken to ensure homogeneity (see Appendix C), these groups are likely more heterogeneous than desired.

Happiness. A single item asked the respondent to indicate his/her level of happiness on a five-point scale [i.e., "Would you describe yourself as being usually: (happy and interested in life, somewhat happy, somewhat unhappy, unhappy with little interest in life, so unhappy that life is not worthwhile")]. Responses were coded so that higher scores indicated greater happiness.

Self-Rated Health. A question asked participants to rate their global health on a five-point scale [i.e., "In general, would you say your health is: (excellent, very good, good, fair, or poor")?]. Higher scores indicated greater Self-Rated Health (SRH).

Satisfaction with Life. A single 10-point item was used to assess life satisfaction (i.e., "Using a scale of 1 to 10 where 1 means "Very dissatisfied" and 10 means "Very satisfied", how do you feel about your life as a whole right now?"). Coding retained original format so that higher scores indicated greater satisfaction with life (SWL).

Research Questions

Study 2 investigated Happiness, Self-Rated Health (SRH), and Satisfaction with Life (SWL). Each outcome was tested independently of the other outcome variables, but identical hypotheses were made for each regression model:

Block 1: Demographic covariates were entered.

Block 2: R/S constructs were entered.

Block 3: Religious Identity was entered, the non-religious were the reference group.

Block 4 (stepwise regression): Religious Identity was tested as a potential moderator for Attendance, Prayer/Meditation, and Religiosity in their individual relationships with the outcome variable.

Hypothesis: Moderator terms were predicted to be positive (this is a one-tailed hypothesis). This would support the contention that the non-religious experience R/S constructs less positively than Christians.

Block 5: Social support covariates and mastery covariates were entered.

Hypothesis: Significant moderation terms will remain significant. If supported this would suggest the observed moderation terms are robust.

Hypothesis: When compared on the highest levels for any moderated R/S construct, the non-religious are predicted to report lower health than Christians (this is a one-tailed hypothesis). This would support the contention that the non-religious experience higher levels of R/S constructs less positively than Christians.

Results

Happiness

Happiness was regressed onto demographic covariates in Block 1, $F(12, 8240) = 12.11$, $p < .001$, $R^2 = .028$. Religious/Spiritual constructs were entered in Block 2, $\Delta R^2 = .008$, $F(3, 8237) = 14.48$, $p < .001$, $R^2 = .036$. Attendance was a significant positive predictor of Happiness, $t = 4.14$, $p < .001$, 95% CI [0.04, 0.10], and Religiosity was a

significant predictor of Happiness $t = 2.86$, $p = .004$, 95% CI [0.02, 0.10]. Religious Identity was entered in Block 3, $\Delta R^2 = .000$, $R^2 = .037$, but it was not a significant predictor $t(8236) = 1.11$, $p = .267$.

Interaction terms were entered in a stepwise regression in Block 4, but none were significant. Consequently, covariates in Block 5 were not explored. As a follow-up analysis, it was investigated whether a sample comprised wholly of the non-religious would benefit from R/S constructs. In these cases, none of the R/S constructs were significant positive predictors of Happiness.

Self-Rated Health

Self-Rated Health (SRH) was regressed onto demographic covariates in Block 1, $F(12, 8240) = 49.62$, $p < .001$, $R^2 = .088$. Religious/Spiritual constructs were entered in Block 2, $\Delta R^2 = .003$, $F(3, 8237) = 4.54$, $p = .004$, $R^2 = .091$. Prayer/Meditation negatively predicted SRH $t = -2.68$, $p = .007$, 95% CI [-0.09, -0.02], and Religiosity positively predicted SRH, $t = 2.68$, $p = .007$, 95% CI [0.02, 0.09]. Religious Identity was entered in Block 3, $\Delta R^2 = .000$, $R^2 = .091$, but it was not a significant predictor $t(8236) = 0.01$, $p = .937$.

Interaction terms were investigated in Block 4, $\Delta R^2 = .001$, $R^2 = .092$. Religious Identity moderated the experience of Attendance in the non-religious, $t(8235) = 2.20$, $p = .014$, 95% CI [0.03, 0.22]. Results indicated that Attendance was non-significantly experienced by the non-religious $t(8235) = -1.55$, $p = .122$, 95% CI [-0.19, 0.02], and was positively experienced by Christians, $t(8235) = 2.13$, $p = .033$, 95% CI [0.01, 0.07]. Social support and mastery covariates were entered in Block 5, $\Delta R^2 = .075$, $F(8, 8227) =$

52.47, $p < .001$, $R^2 = .166$. With the inclusion of these covariates, the Attendance*Religious Identity interaction term remained significant, $t(8227) = 2.23$, $p = .013$, 95% CI [0.03, 0.22]. However, Attendance was no longer a significant positive predictor of SRH for Christians $t(8227) = 1.90$, $p = .058$, 95% CI [-0.00, 0.07].

As a follow up analysis, Christians and the non-religious were compared at the highest level of Attendance (i.e., "At least once a week"). Results indicated that Christians reported better SRH compared to the non-religious, $t(8227) = 2.21$, $p = .014$, B = 0.29, 95% CI [0.08, 0.51]. When Christians and the non-religious were compared at the lowest level of Attendance (i.e., "Not at all"), there were no differences between the groups. Christians were healthier, but only when the non-religious reported atypically high levels of Attendance, $t(5821.53) = -62.01$, $p < .001$; $M_{diff} = -1.06$, 95% CI [-1.09, -1.02]. In a follow-up analysis only the non-religious were retained to investigate the effects of R/S constructs on SRH. In this analysis, no R/S constructs significantly and positively predicted SRH.

Satisfaction with Life

Satisfaction with Life (SWL) was regressed onto demographic covariates in Block 1, $F(12, 8240) = 21.88$, $p < .001$, $R^2 = .052$. Religious/Spiritual constructs were entered in Block 2, $\Delta R^2 = .007$, $F(3, 8237) = 13.12$, $p = .001$, $R^2 = .059$. Attendance, $t = 4.60$, $p < .001$, 95% CI [0.05, 0.11], and Religiosity, $t = 2.64$, $p = .008$, 95% CI [0.01, 0.09] positively predicted SWL. Prayer/Meditation, $t = -3.96$, $p < .001$, 95% CI [-0.11, -0.04] negatively predicted SWL. Religious Identity was entered in Block 3, $\Delta R^2 = .000$, $R^2 = .059$, but it was not a significant predictor $t(8236) = 1.34$, $p = .182$.

Interaction terms were entered in Block 4, ΔR^2= .001, R^2= .060. Religious Identity significantly moderated Attendance, t(8235) = 2.54, p = .006, 95% CI [0.05, 0.25]. Social support and mastery covariates were entered in Block 5, ΔR^2= .155, F(8, 8227) = 102.61, p < .001, R^2= .215. Even with these covariates, the Attendance*Religious Identity interaction term remained significant, t(8227) = 2.37, p = .018, 95% CI [0.04, 0.22], suggesting a robustness to this interaction. Christians experienced Attendance positively t(8227) = 4.27, p < .001, 95% CI [0.04, 0.10], and the non-religious experienced Attendance non-significantly t(8227) = -1.09, p = .274, 95% CI [-0.15, 0.03].

A follow-up test indicated that being a Christian was associated with higher SWL, t(8227) = 2.73, p = .003, B = 0.36, 95% CI [0.14, 0.58], when at the highest level of Attendance (i.e., "At least once a week"). When the lowest levels of Attendance were compared (i.e., "Not at all") there were no differences between groups. When the regression model was re-run with only the non-religious as the sample, R/S constructs were non-predictive of SWL.

Discussion

The three major findings emerged from the current study. First, Religious Identity acted as a moderator for the relationship between Attendance and health outcomes. This finding supports the idea that attending church services are not necessarily positively associated with health for everyone. Additionally, these moderated relationships remained significant even when considering social support and mastery covariates. This robustness is important as it suggests the observed effect was not attributable to well-established confounding variables. Moreover, the pattern of moderation was consistent

with the general hypothesis that R/S Minorities experience R/S constructs less positively than their peers. Second, health differences between the non-religious and Christians did not emerge until the non-religious were tested on the highest level of Attendance. This is consistent with the idea that higher levels of Attendance are not beneficial for the non-religious, and that Christians experience higher levels of Attendance more positively than the non-religious. Third, when only the non-religious were considered as a sample, none of the three R/S constructs were found to be significant positive predictors of Happiness, SRH, or SWL. All three of these findings converge and support the idea that R/S is not experienced uniformly by R/S Minorities.

Interestingly, whereas Prayer/Meditation and Religiosity were the R/S constructs that were moderated in Study 1, only Attendance was moderated in Study 2. These differences may have reflected the different population used in Study 1, or may have been the product of the different health outcome measures used in Study 2. Alternatively, these differences in moderation may have also been reflective of how R/S constructs were initially related to health outcomes. It was far more common for R/S constructs to be related to health outcomes in Block 2 in Study 2, than it had been in Study 1. In short, these differences are of interest, but do not threaten the findings of the current study.

Like Study 1, Study 2 highlighted why R/S identities should be considered when describing the relationship between R/S constructs and health. For example, Attendance was a non-significant predictor of Self-Rated Health (SRH) in Block 2; however, with the inclusion of the moderator term in Block 4, Attendance became a significant positive predictor of SRH for Christians, and a non-significant predictor for the non-religious. In

essence the non-religious "dragged down" the overall relationship between Attendance and SRH in the general sample. The consequence of this was that a relationship that was significant for ~80% of the population was not recognized, because ~20% of the participants were functionally outliers.

The role of added covariates (i.e., social support and mastery) after the inclusion of interaction terms tested the robustness of the observed interaction effects. This step turned out to be informative as the relationship between Attendance and SRH was initially non-significant, made significant by the inclusion of moderator terms, and was then reduced to non-significance with the inclusion of social support and mastery covariates. In other words, the relationship between Attendance and SRH was subordinated to social support and mastery covariates. However, this was the only situation in which either social support or mastery wholly removed a R/S construct from significance. While it is tempting to infer the inclusion of social support or mastery variables was therefore largely irrelevant, this conclusion is without merit. Prior to the inclusion of social support or mastery covariates, it was unclear whether the described relationship between R/S constructs and health outcomes was the product of an underlying third variable. Consequently, the relevance of any moderating term would be questionable as the variance associated with that relationship may be subsumed by that third variable; the inclusion of extensive covariate control mitigated this issue to some extent.

Because R/S identities can moderate the relationships between R/S constructs and health outcomes, and because these moderated terms can influence the overall role of R/S

constructs in the prediction of health, it is vital that researchers consider the possibility of interaction effects. Researchers who include additional covariates (e.g., social support) but fail to consider R/S identities acting as a moderator, run the risk of over-generalizing the effects of R/S constructs on health. Ideally, both additional covariates and moderator terms should be considered when describing general populations. Occasionally, R/S constructs *did* predict positive health outcomes, but these relationships did not necessarily extend to the non-religious. When only the non-religious were considered, R/S constructs were not positive and significant predictors of health outcomes.

Limitations

The major limitation in Study 2 was the usage of Religious Identity as a moderating variable. This problem is caused by subgroups of the non-religious who may be behaviourally and attitudinally indistinguishable from Christians within the group (Hackett, 2014). Unfortunately, because the 2008 Canadian General Social Survey did not investigate more specific R/S identities, this issue could not be resolved in Study 2. However, within Study 3 a more homogeneous R/S identity were used: atheists.

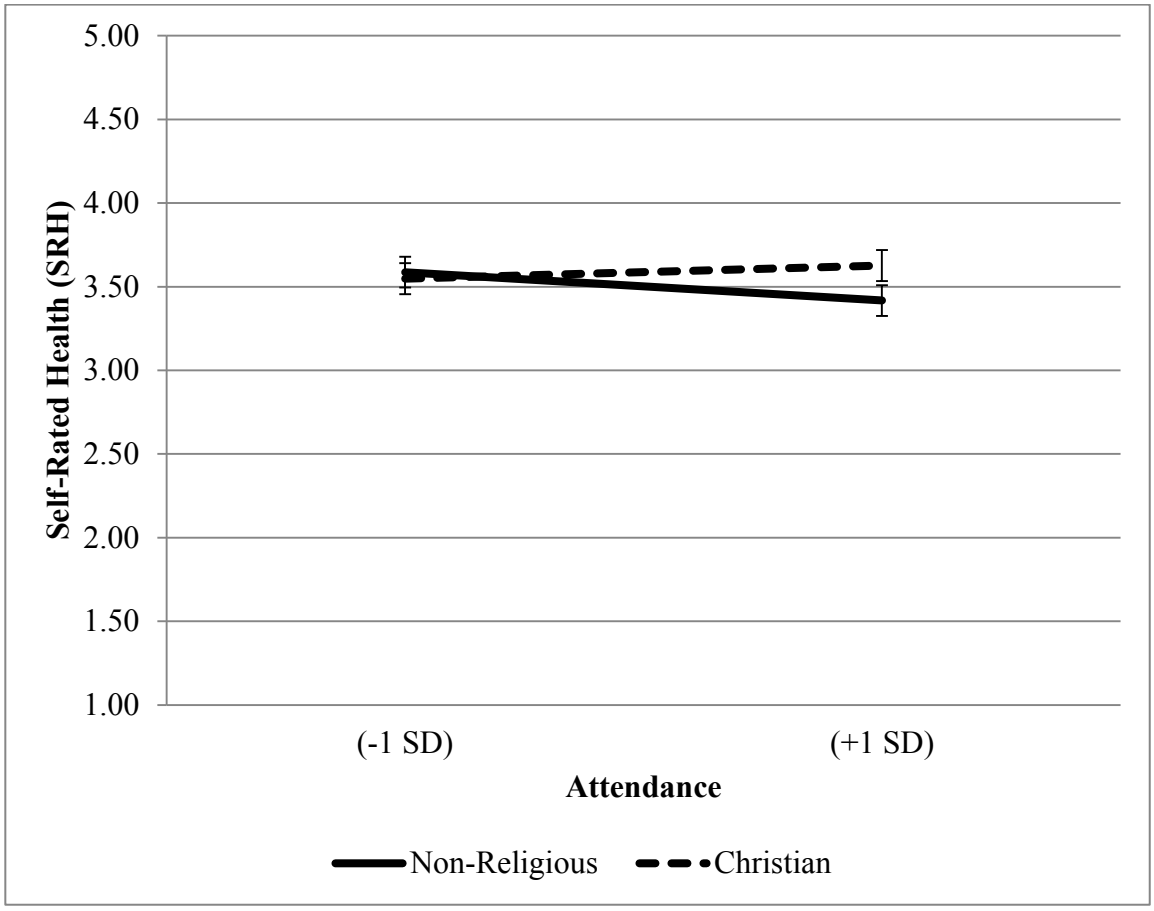

Figure 2.1. Religious Identity Moderates the Experience of Attendance in the Prediction of Self-Rated Health.

Note: Values were mean centered. Error bars represent 95% confidence intervals.

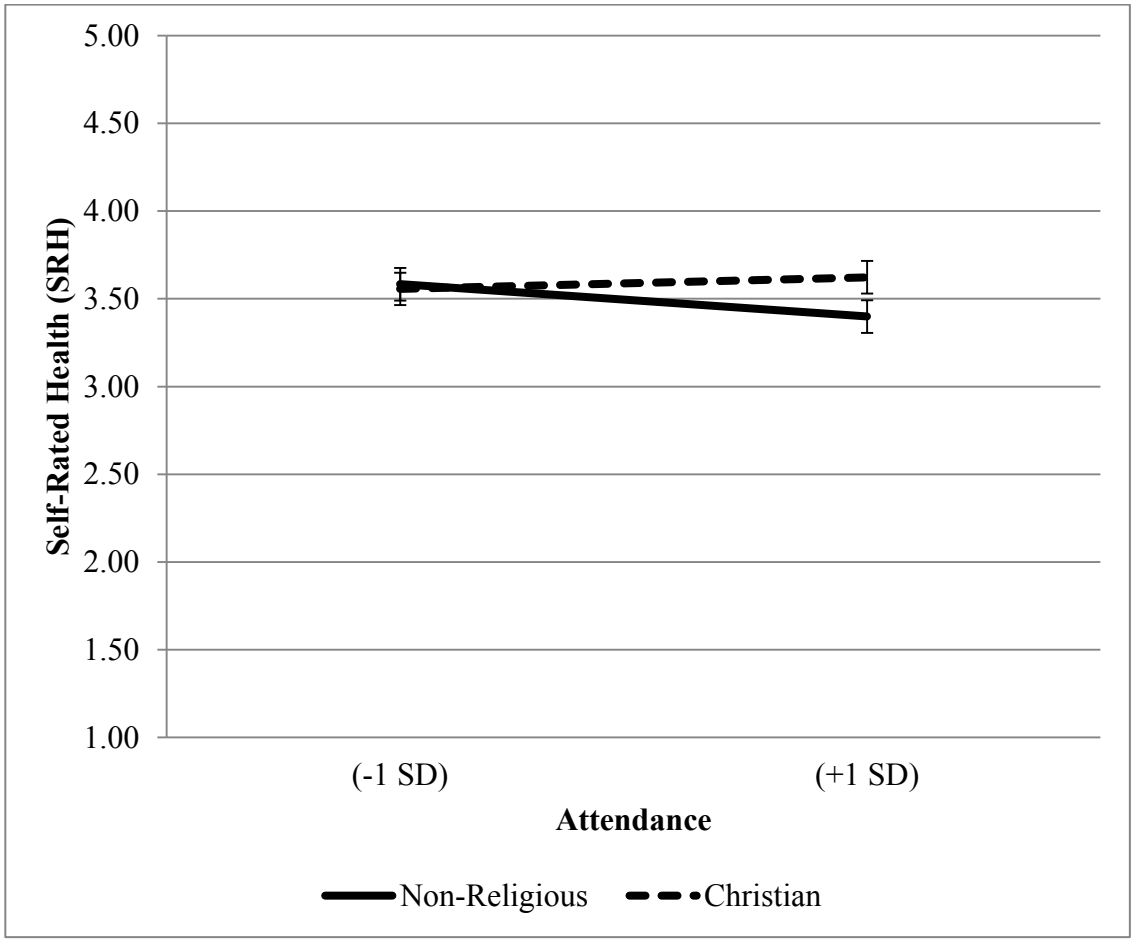

Figure 2.2. Religious Identity Moderates the Experience of Attendance in the Prediction of Self-Rated Health, while controlling for social support and mastery covariates.

Note: Values were mean centered. Error bars represent 95% confidence intervals.

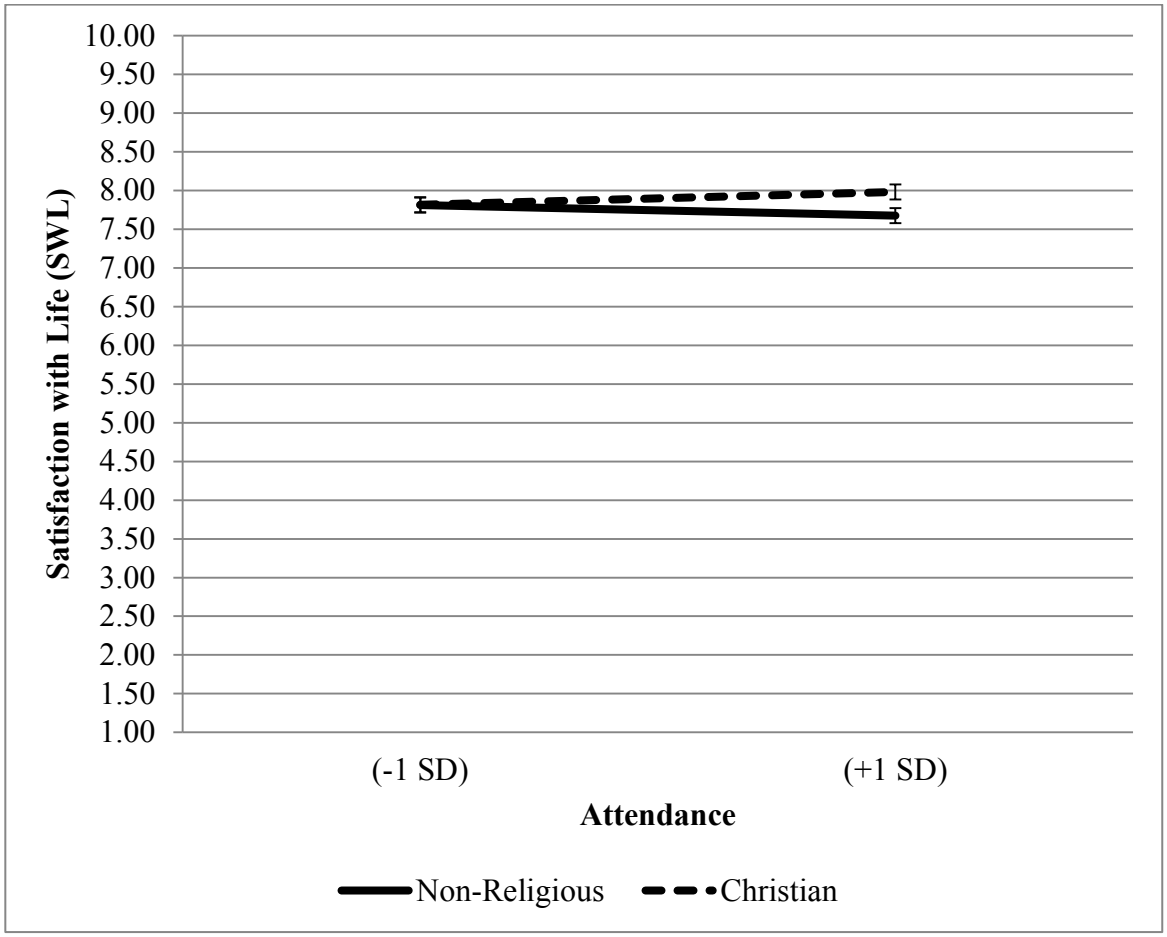

Figure 2.3. Religious Identity Moderates the Experience of Attendance in the Prediction of Satisfaction with Life.

Note: Values were mean centered. Error bars represent 95% confidence intervals.

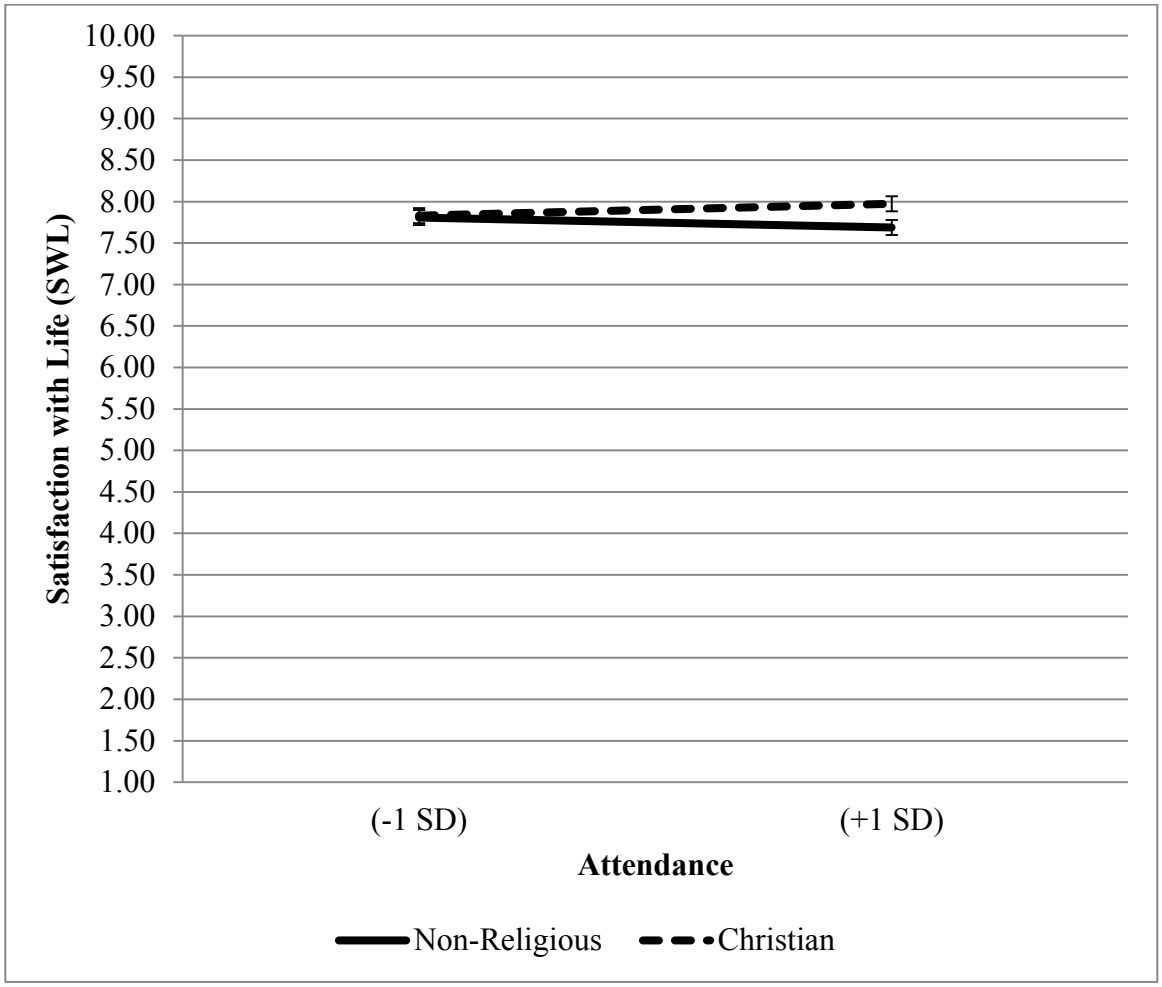

Figure 2.4. Religious Identity Moderates the Experience of Attendance in the Prediction of Satisfaction with Life, while controlling for social support and mastery covariates. Note: Values were mean centered. Error bars represent 95% confidence intervals.

Table 2.1

	All		Non-Religious		Christian	
	M	SD	M	SD	M	SD
Happiness	4.75	0.53	4.69	0.55	4.76	0.52
Self-Rated Health	3.59	1.04	3.62	1.02	3.58	1.05
Satisfaction with Life	7.89	1.70	7.71	1.68	7.95	1.70
Sex (Male/Female)	1.50	0.50	1.45	0.50	1.51	0.50
Age	7.75	3.15	6.68	2.80	8.09	3.18
Race (White/Non-White)	1.09	0.28	1.12	0.32	1.08	0.27
Married (Partner/No Partner)	1.72	0.45	1.68	0.47	1.73	0.44
Education	4.21	1.11	4.34	1.02	4.17	1.14
Income	9.73	2.35	9.90	2.36	9.67	2.34
Attend	2.56	1.57	1.32	0.76	2.97	1.55
Prayer/Meditation	3.29	1.75	2.01	1.56	3.71	1.60
Religiosity	2.92	1.07	2.11	1.14	3.19	0.89
Satisfied with relatives	4.10	0.87	4.03	0.86	4.12	0.87
Satisfied with friends	4.10	0.82	4.05	0.84	4.12	0.82
Number of friends	6.67	9.93	5.96	7.63	6.91	10.56
Frequency of seeing friends	4.11	1.42	4.13	1.45	4.10	1.42
Number of new people met	0.69	1.07	0.7	1.09	0.69	1.06
Number of neighbours known	2.74	0.95	2.51	0.90	2.82	0.96
Number of secular orgs. belong to	1.34	1.25	1.29	1.24	1.36	1.26
Mastery	26.64	3.85	27.18	3.97	26.46	3.80
N =	8253		1776		6477	

Table 2.2

Regression Model Predicting Happiness Using Religious Identity as a Moderator

	Unstandardized B Coefficient/Robust Standard Error				
	Block 1	Block 2	Block 3	Block 4	Block 5
Constant	.000/.014	.000/.014	-.035/.034		
Sex (Male)	.105/.028***	.090/.029**	.090/.029**		
Age	.025/.015†	.003/.015	.002/.015		
Race (White)	-.079/.056	-.113/.056*	-.107/.056†		
Married (Partner)	.139/.035***	.128/.035***	.128/.035***		
Education	.026/.015†	.022/.015	.023/.015		
Income	.123/.017***	.126/.017***	.125/.017***		
Province (NL)	-.106/.050*	-.078/.049	-.071/.050		
Province (PE)	-.092/.070	-.061/.070	-.057/.070		
Province (NS)	.045/.051	.049/.051	.054/.051		
Province (ON)	.025/.036	.025/.036	.027/.036		
Province (MB)	-.000/.051	-.005/.051	-.006/.051		
Province (SK)	-.128/.051*	-.125/.051*	-.123/.051*		
Attend		.067/.016***	.062/.017***		
Prayer/Meditation		-.028/.019	-.031/.020		
Religiosity		.058/.020**	.054/.020**		
Rel.ID. (Non-Religious)			.046/.042		
Satisfied with relatives					
Sat. with friends					
Number of friends					
Freq. seeing friends					
New people met					
Neighbours known					
Secular orgs.					
Mastery					
R^2/ ΔR^2	.028/.028***	.036/.008***	.037/.000		

R/S IDENTITIES AND HEALTH

Note: Omitted province was Alberta. Parenthesized words indicate which categorical level was the lowest.

$^{\dagger}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Table 2.3

Regression Model Predicting Self-Rated Health Using Religious Identity as a Moderator

	Unstandardized B Coefficient/Robust Standard Error				
	Block 1	Block 2	Block 3	Block 4	Block 5
Constant	.000/.013	.000/.013	.002/.031	-.088/.051†	-.099/.051†
Sex (Male)	.014/.027	.012/.027	.012/.027	.013/.027	-.009/.027
Age	-.106/.014***	-.116/.015***	-.116/.015***	-.117/.015***	-.099/.015***
Race (White)	-.184/.057**	-.196/.058**	-.197/.058**	-.195/.058**	-.061/.059
Married (Partner)	.015/.032	.009/.032	.009/.032	.009/.032	.023/.031
Education	.090/.014***	.089/.014***	.089/.014***	.089/.014***	.057/.014***
Income	.211/.016***	.211/.016***	.211/.016***	.211/.016***	.151/.016***
Province (NL)	-.109/.052*	-.095/.052†	-.095/.053†	-.097/.053†	-.071/.053
Province (PE)	.030/.064	.046/.064	.046/.064	.047/.064	.065/.065
Province (NS)	-.019/.049	-.013/.049	-.014/.050	-.015/.050	-.013/.048
Province (ON)	-.035/.036	-.033/.036	-.034/.036	-.034/.036	.042/.035
Province (MB)	-.021/.053	-.018/.053	-.019/.053	-.018/.053	-.010/.049
Province (SK)	-.009/.055	-.007/.055	-.007/.055	-.006/.055	.013/.054
Attend		.030/.017†	.030/.018†	-.085/.055	-.092/.055†
Prayer/Meditation		-.052/.019**	-.052/.019**	-.052/.019**	-.050/.019**
Religiosity		.054/.020**	.054/.020**	.055/.020**	.053/.020**
Rel.ID (Non-Religious)			-.003/.037	.085/.054	.099/.054†
Attendance*Rel. ID				.124/.056*	.125/.056*
Satisfied with relatives					.092/.015***
Sat. with friends					.022/.015
Number of friends					.003/.016
Freq. seeing friends					.019/.014
New people met					-.001/.013
Neighbours known					.038/.013**
Secular orgs.					.033/.014*
Mastery					.241/.015***

Table 2.3

Regression Model Predicting Self-Rated Health Using Religious Identity as a Moderator

	Unstandardized B Coefficient/Robust Standard Error				
	Block 1	Block 2	Block 3	Block 4	Block 5
R^2/ ΔR^2	.089/.089***	.091/.003**	.091/.000	.092/.001*	.166/.075***

Note: Omitted province was Alberta. Parenthesized words indicate which categorical level was the lowest.

$^{\dagger}p$ <.10, $^{*}p$ <.05, $^{**}p$ <.01, $^{***}p$ <.001

Table 2.4

Regression Model Predicting Satisfaction with Life Using Religious Identity as a Moderator

	Unstandardized B Coefficient/Robust Standard Error				
	Block 1	Block 2	Block 3	Block 4	Block 5
Constant	.000/.013	.000/.013	-.037/.031	-.148/.054**	-.143/.051**
Sex (Male)	.056/.027*	.056/.027*	.057/.027*	.057/.027*	.036/.025
Age	.059/.015***	.043/.015**	.042/.015**	.041/.015**	.062/.015***
Race (White)	-.083/.053	-.111/.053*	-.104/.053†	-.102/.053†	.057/.050
Married (Partner)	.286/.033***	.273/.033***	.273/.033***	.273/.033***	.316/.031***
Education	.001/.015	-.001/.014	.000/.014	.000/.014	-.027/.014*
Income	.140/.017***	.141/.017***	.140/.017***	.139/.017***	.068/.016***
Province (NL)	-.291/.054***	-.263/.054***	-.255/.054***	-.257/.054***	-.219/.052***
Province (PE)	-.054/.073	-.024/.073	-.019/.073	-.017/.073	.016/.070
Province (NS)	-.114/.049*	-.106/.049*	-.100/.049*	-.101/.049*	-.101/.046*
Province (ON)	-.055/.036	-.052/.036	-.049/.036	-.049/.036	-.066/.033*
Province (MB)	-.111/.052*	-.107/.052*	-.105/.052*	-.104/.052*	-.102/.046*
Province (SK)	-.188/.052***	-.183/.051***	-.181/.051***	-.180/.051***	-.168/.049**
Attend		.078/.017***	.072/.017***	-.068/.058	-.060/.055
Prayer/Meditation		-.071/.019***	-.075/.019***	-.075/.019***	-.068/.017***
Religiosity		.053/.020**	.049/.020*	.050/.020*	.051/.019**
Rel.ID (Non-Religious)			.050/.037	.157/.057**	.155/.053**
Attendance*Rel. ID				.150/.059*	.131/.055*
Satisfied with relatives					.099/.015***
Sat. with friends					.117/.014***
Number of friends					.037/.015*
Freq. seeing friends					.035/.013**
New people met					.020/.012
Neighbours known					.046/.013***
Secular orgs.					-.013/.013
Mastery					.321/.015***

Table 2.4

Regression Model Predicting Satisfaction with Life Using Religious Identity as a Moderator

	Unstandardized B Coefficient/Robust Standard Error				
	Block 1	Block 2	Block 3	Block 4	Block 5
R^2/ ΔR^2	.052/.052***	.059/.007***	.059/.000	.060/.001*	.215/.156***

Note: Omitted province was Alberta. Parenthesized words indicate which categorical level was the lowest.

†p <.10, *p <.05, **p <.01, ***p <.001

Study 3: Testing Atheist Identities as Moderators, in a General Sample

As discovered in Study 1 and Study 2, Religious Identity and Spiritual Identity affected how R/S constructs (Attendance, Prayer/Meditation, and Religiosity) related to health outcomes. However, a major limitation of these studies was the possible inadequacy of the Religious Identity and Spiritual Identity manipulation. In short, because the non-religious and Non-Spiritual were heterogeneous groups, it is likely that subsets of these groups experienced R/S constructs positively. While there are many ways in which to delineate between groups on the basis of R/S categories, a way that shows conceptual promise is delineating between persons based on a belief or non-belief in god(s).

Definition of Atheism

The term "atheism" is widely misunderstood and heavily stigmatized (Hwang et al., 2011). In the simplest sense of the word, an "atheist" is a person who does not believe in god(s) (Baker & Robbins, 2012; Broeckaert et al., 2009; Tam, Lee, Har, Chan, 2011; Caldwell-Harris et al., 2011; Cragun, Kosmin, Keysar, Hammer, & Nielsen, 2012; D'Andrea & Sprenger, 2007; Hwang, 2008; Kaskutas, Turk, Bond, & Weisner, 2003; O'Brian-Baker & Smith, 2009). Anyone who would not agree with the statement "I believe in god(s)" is definitionally an atheist; this form of atheism is called "negative atheism" because it is through the absence of belief that the individual is an atheist. In a related vein, anyone who would agree with the statement "There are no god(s)" would be definitionally a "positive atheist"; this term is used because the person is holding the positive position that there are no god(s). While atheism is erroneously assumed to

encompass only positive atheism, this tends to be a less inclusive perception of what atheism is.

Despite a particularly simple definition that could be used, atheism has been instead defined in a variety of ways (Weber, Pargament, Kunik, Lomax, & Stanley, 2012). Atheism has been equated with being non-religious (Grözinger & Matiaske, 2013), non-participation in religious events (Hsaio, Chiang, Lee, & Han, 2013), and non-belief in an afterlife (Lundh & Radon, 1998). While these definitions have some conceptual similarities, very different beliefs, behaviours, and motivations are encompassed within these definitions (Hackett, 2014; Horning et al.; Hwang et al., 2011; Sherkat, 2008). Because of these definitional dissimilarities, comparisons between studies are often not possible. To add to these definitional issues, many studies ask that persons self-identify as atheist.

While self-identification is a common approach to Religious Identity, this approach in addressing atheism is problematic as there may be a social reluctance to identify as an atheist (Horning et al., 2011). The exact reason for this unwillingness may be varied, but it is noteworthy that atheists have experienced historical and current discrimination and are often mistrusted (Gervais, Shariff, & Norenzayan, 2011; Gervais, 2012; Gervais, 2013). Troublingly, atheists tend to realize that they are perceived negatively (Saroglou, Yzerbyt, & Kaschten, 2011), which may disincline atheists to identify as such. In addition to these aforementioned issues, there is a subtle conceptual problem regarding the identification of atheists that has been ignored within much of the literature.

Categorizing persons as atheists has been historically difficult, particularly because atheism is viewed as a Religious Identity (Hackett, 2014). Atheism/theism is *only* a question of belief/non-belief, and is not necessarily connected to how a person perceives themselves in relation to a religious group (which function as social identities). Persons can identify with any number of religious faiths without having a concomitant belief in god(s). This produces issues with intragroup variability as atheists could be counted as a part of a religious group. For a person to be "counted" as an atheist, he/she person must *not* identify as part of a religious group *and* label him/herself as an atheist. This produces a situation in which atheists are then undercounted by census information, as atheists are often considered to be a subset of the non-religious group (O'Brian-Baker & Smith, 2009). Also, this data collection approach seems to ignore the possibility of non-believers identifying as a part of a religious tradition, simply because they were brought up in that specific faith. It is important to note that this objection is not suggesting that Religious Identity and atheist identities are unrelated; it is that these identities are the product of two distinct questions – "Do you believe in god(s)?" and "What religion do you identify as being a part of?".

Agnosticism. Within discussions of religious beliefs, the term "agnostic" is often presented as an alternative to atheism or theism. Agnosticism has numerous conceptualizations, and there does not appear to be a uniform method in which to define the construct (Benn, 1999). Typically, persons will indicate that they are agnostic if they are unsure if god(s) exist, or that the nature of god(s) is ultimately unknowable. However, this category of responses can be thought to be an invalid set of responses to the question

of "Do you believe in god(s)?". Questions regarding belief in god(s) are theological in nature (i.e., they deal with belief), while responses grouped under agnosticism are epistemological in nature (i.e., they deal with knowledge). This may seem like a trivial distinction, but it is important in understanding why the atheist/theist binary is both exhaustive and exclusive.

Persons who respond to the question, "Do you believe in god(s)" with, "I do not know if god(s) exist" or "I believe that no one can know the answer to that question", are not actually responding to the question at hand. They are instead indicating that knowledge has limitations, *but this is not what is being inquired about*. A person is able to believe something without having certainty that they are correct, in fact nearly all aspects of human socialization and functioning are bereft of absolute certainty. While agnosticism is occasionally used as an indicator that a person is unsure of what they believe (i.e., "I do not know what I believe"), this means that they do not have access to those beliefs, not that those beliefs do not exist. Because belief and certainty are different elements to the question of a god(s)' existence, it is possible to be an agnostic atheist, a gnostic atheist, an agnostic theist, and a gnostic theist.

Atheism and Health

Using atheists as a R/S identity grouping variable shows conceptual promise because atheists engage in R/S constructs less than non-atheists (O'Brian-Baker & Smith, 2009). Additionally, atheists are unified on the basis of non-belief in god(s), which is arguably a more substantive piece of information than merely identifying as a member of a specific religious denomination. This non-belief is also important as both Prayer and

Religiosity seem contingent on the existence of a deity. Unlike the non-religious or Non-Spirituals who may have wide ranging beliefs regarding deities, atheists by definition do not have these beliefs. In short, atheism appears to offer a more refined grouping variable than what was used in Study 1 and Study 2. Much like other R/S Minorities, atheists are rarely studied within the Religion/Spirituality-health literature (D'Andrea & Sprenger, 2007; Galen & Kloet, 2011; Hwang, 2008; Hwang et al., 2011; Jenks, 1986; Lizardi & Gearing, 2010; Smith-Stoner, 2007; Whitley, 2010). This absence of research is surprising as atheists would make a reasonably good "control" group for many R/S topics.

While the extant literature rarely addresses atheism as a predictor of health, there has been some literature that suggests possessing belief in god(s) confers health advantages. Some literature suggests that belief in eternal life (Ellison et al., 2001), belief in God (Ekedahl & Wengström, 2010; Rosmarin et al., 2013), and strong belief salience (Schnall et al., 2010) are related to a variety of positive health outcomes. Additionally, some literature suggests that a loss of belief in god(s) is distressing (Herzbrun, 1999). While studies often do not compare atheists to theists (Hwang et al., 2011), the findings would suggest that belief in god(s) is advantageous to health outcomes; however, this position is not without its detractors (e.g., Buggle, Bister, Nohe, Scheider, & Uhmann, 2000). Surprisingly, the health consequences of atheism have not been rigorously investigated; however, given that R/S appears to be strongly linked to positive health outcomes, it is possible that atheists may have poorer health outcomes on this basis alone.

As noted in Study 1 and Study 2, using Religious Identity as a moderator variable is problematic due to the heterogeneity of this group. To address this heterogeneity issue, Study 3 examined atheism as a moderator for the relationships between R/S constructs and SRH. Study 3 is comprised of Study 3.1 and Study 3.2, both of which investigate atheist identity as a moderator. Study 3.1 and Study 3.2 used slightly different definitions of atheism when examining these interaction terms; one identity was based on positive atheism and the other identity was based on negative atheism. While Study 1 and Study 2 used Canadian data, Study 3 and Study 4 used American data. Consequently, results from all four studies are not intended to be directly compared, but are meant to provide independent lines of evidence for the idea that R/S Minorities experience R/S constructs differently from how R/S Majorities experience them.

Method

Data Source

The 1972-2012 American General Social Survey cumulative file was accessed through the Inter-University Consortium for Political and Social Research (Smith, Hout, & Marsden, 2013) (Study number 34802). The American General Social Survey is a national probability sample of the resident population of the United States of America that conducts face-to-face interviews. Study 3.1 used pooled data from the 2008, 2010, and 2012 years of the survey, and compared atheists on "Positive Atheist Identity" (see section below). These years of study were chosen because they allowed for data to be pooled together. Study 3.2 used data from 2008, and compared atheists on "Negative

Atheist Identity" (see section below). This data was chosen because 2008 was the only year in the past 10 years that had an item addressing atheism as a question of non-belief.

Survey Items

Demographics. Age (measured by year), sex (male/female), real household income (measured on a continuous scale), years of education (measured on a continuous scale), region (New England, Middle Atlantic, Eastern North Atlantic, Western North Atlantic, South Atlantic, Eastern South Atlantic, Mountain, Pacific), marital status [partner (married) or no partner (widowed, divorced, separated, never married)], minority status (white/non-white), and year [2008, 2010, 2012 (Study 3.1 only)] were all included as covariates.

R/S constructs. A nine-point Attendance item ("How often do you attend religious services?"), a six-point Prayer item ("How often do you pray?"), and a four-point Religiosity item ("To what extent do you consider yourself a religious person?"). All questions were coded so that higher scores indicated a greater frequency of behaviour or a stronger attitude. Within Study 3 and Study 4, Meditation was no longer assessed as part of the Prayer variable, so "Prayer/Meditation" is referred to as "Prayer" for Study 3 (and for Study 4 as well).

Positive Atheist Identity. A single question "...which statement comes closest to expressing what you believe about God" ("I don't believe in God."; "I don't know whether there is a God and I don't believe there is any way to find out."; "I don't believe in a personal God, but I do believe in a higher power of some kind."; "I find myself believing in God some of the time, but not at others"; "While I have doubts, I feel that I

do believe in God."; "I know God exists and I have no doubts about it.") was used to assess Positive Atheist Identity. Persons who indicated that they "did not believe in God" were classified as Positive Atheists, while non-atheists were anyone who was not a Positive Atheist. Persons indicating, "I don't know whether there is a God and I don't believe there is any way to find out" (i.e., ~agnostics) were classed as non-atheists for this grouping measure. It is important to note that this question inquires about both belief *and* certainty, which is why it is a *proxy* measure of atheism. While previous research has conceptualized these two topics as a single question (e.g., Galen & Kloet, 2011), this question has two dimensions: belief (atheist/theist) and knowledge (agnostic/gnostic). Positive Atheist Identity was used in Study 3.1.

Negative Atheist Identity. The item, "Which best describes your belief about God?" was used to establish Negative Atheist Identity. Possible responses to this question were, "I don't believe in God now, and I never have"; "I don't believe in God now, but I used to"; "I believe in God now, but didn't used to"; and "I believe in God now, and I always have". Persons were identified as Negative Atheists if they provided a response that started with "I don't believe in God now...". Conversely, non-atheists were classified as anyone providing a response with "I believe in God now...". Negative Atheist Identity was used in Study 3.2.

Self-Rated Health. Like in other studies, Self-Rated Health (SRH) was assessed on a four-point scale with higher scores representing a greater level of health ("Would you say your own health, in general, is excellent, good, fair, or poor?"). Items were reverse coded so that higher scores reflected greater health.

Study 3.1

Participants

Study 3.1 used data from 2008, 2010, and 2012. The data collection methodology for these years was similar, so data was pooled to improve statistical power. To be eligible for participation within the current study, the respondents had to be 18 years of age and older, and answer all relevant items. Respondents answering, "I don't know" or who refused to provide answers to questions were excluded from analysis in order to maintain the continuous nature of the data. For further details on the sampling technique see Smith et al. (2013). Of the described criteria, there were 3427 respondents who fit the aforementioned criteria (1572 male, 1855 female), with the average age of the respondents being 45.63 (SD = 16.33) years of age. Within this sample, there were 108 Positive Atheists (3.15% of the entire sample), 29 of which identified as being a part of a religious tradition (26.85%). See Table 3.1.1 for descriptive statistics.

Research Questions

Study 3.1 investigated the relationship between R/S constructs (Attendance, Prayer, and Religiosity) and Self-Rated Health (SRH) with linear regression.

Block 1: demographic covariates were entered.

Block 2: R/S constructs were entered.

Block 3: Positive Atheist Identity was entered. Positive Atheists were the reference group.

Hypothesis: Because of the poor quality of the extant literature, no directional hypotheses will be offered regarding whether Positive Atheists are more or less healthy than non-atheists.

Block 4 (stepwise regression): Positive Atheist Identity is tested as a moderator for the relationships between Attendance, Prayer, and Religiosity, and SRH.

Hypothesis: Significant moderation terms will be positive (this is a one-tailed hypothesis). This will support the contention that Positive Atheists experience R/S constructs more negatively than non-atheists.

Hypothesis: When compared on the highest levels for any moderated R/S construct, Positive Atheists are predicted to report poorer SRH than non-atheists (this is a one-tailed hypothesis). This would support the contention that Positive Atheists experience higher levels of R/S constructs less positively than non-atheists.

Results

Self-Rated Health (SRH) was regressed on covariates in Block 1 $F(16, 300) = 18.88$, $p < .001$, $R^2 = .107$. Religious/Spiritual constructs were entered in Block 2, $\Delta R^2 = .007$ $F(3, 300) = 6.54$, $p < .001$, $R^2 = .114$. Results indicated that Attendance positively predicted SRH, $t = 3.91$, $p < .001$, 95% CI [0.05, 0.16]. Self-Rated Health was regressed on Positive Atheist Identity in Block 3, $\Delta R^2 = .000$, $R^2 = .114$, but it was not a significant predictor $t(300) = 0.91$, $p = .364$. Results would suggest that being a Positive Atheist was not associated with poorer global health. A stepwise regression was used in Block 4, $\Delta R^2 = .002$, $R^2 = .116$, and Positive Atheist Identity moderated the relationship between

Religiosity and SRH, $t(300) = 3.43$, $p < .001$, 95% CI [0.15, 0.56] (see Figure 3.1.1). Positive Atheists experienced a main effect of Religiosity, $t(300) = -3.39$, $p = .001$, 95% CI [-0.58, -0.16], while Religiosity was non-significant for non-atheists.

With the inclusion of Block 4, being a Positive Atheist was associated with poorer SRH, at only moderate amounts of Religiosity (see Table 3.1.2). When potential differences between Positive Atheists and non-atheists were compared at the highest level of Religiosity (i.e., "Very religious"), these differences were maintained, $t(300) = 3.77$, $p < .001$, B = 1.08, 95% CI [0.61, 1.54]. Not only did Positive Atheists experience Religiosity more negatively, when Positive Atheists and non-atheists reported the same high levels of Religiosity, non-atheists reported significantly better health. When Positive Atheists were compared to non-atheists at the lowest level of Religiosity (i.e., "Not religious"), there were not group differences in terms of SRH. In other words, non-atheists were healthier than Positive Atheists, but only when Positive Atheists demonstrated atypically high levels of Religiosity, $t(344) = -14.76$, $p < .001$, $M_{diff} = -1.23$, 95% CI [-1.39, -1.06].

Attendance was not moderated by Positive Atheist Identity and in an effort to investigate the relationship between Attendance and SRH for Positive Atheists; non-atheists were excluded from the dataset. With only Positive Atheists in the regression model Attendance, $t(300) = 1.05$, $p = .298$, was a non-significant predictor of SRH, and Religiosity remained a significant negative predictor of SRH, $t(300) = -2.22$, $p = .029$, 95% CI [-0.73, -0.04].

Study 3.1 Discussion

Three major findings emerged from Study 3.1. First, the relationship between Religiosity and SRH was moderated by Positive Atheist Identity. This finding suggests that Positive Atheists experience Religiosity more negatively than non-atheists. Second, even when comparing Positive Atheists and non-atheists at the national average level of Religiosity, Positive Atheists reported worse SRH than non-atheists. When these differences were investigated at the highest levels of Religiosity, this difference persisted. Not only do Positive Atheists experience Religiosity negatively, when Positive Atheists and non-atheists report the highest level of Religiosity, Positive Atheists report significantly lower health. Third, when only using a Positive Atheist sample, none of the three R/S constructs were significant positive predictors of SRH. All three of these findings converge with the idea that R/S constructs are experienced differently by Positive Atheists than by non-atheists.

It is important to note that while atheism represents a stronger grouping variable than Religious Identity, approximately1/4 of Positive Atheists reported as being a part of a religious tradition. This fact is consistent with the observation that atheism is not a meaningful assessment of Religious Identity, or Religious Identity is not a meaningful assessment of atheism. Moreover, the variability of the Positive Atheist group may have attenuated the Positive Atheist Identity manipulation, as “religious” Positive Atheists may be different than “non-religious” Positive Atheists. On a conceptual level it may be difficult to imagine that an atheist is religious at all, but it is important to note that

religious affiliation is largely a social identifier, while atheism is only a question of belief in god(s).

Study 3.2

Participants

Study 3.2 only utilized data from the 2008 American General Social Survey. This year was chosen because it was the only research year in the past decade, which included an item that could be used to directly assess negative atheism. Study 3.2 only included participants 18 years of age and older, all of whom answered all relevant items. Of the described criteria, there were 596 respondents who fit the aforementioned criteria (260 male, 336 female), with the average age of the respondents being 47.84 (SD = 17.52) years of age. Within this sample, there were 66 Negative Atheists (11.07% of the national sample). Out of the 66 Negative Atheists, 23 identified as being a part of a religious tradition (34.84%). See Table 3.2.1 and descriptive statistics.

Research Questions

Study 3.2 investigated the relationship between R/S constructs (Attendance, Prayer, and Religiosity) and Self-Rated Health (SRH), primarily through regression.

Block 1: demographic covariates were entered.

Block 2: R/S constructs were entered.

Block 3: Negative Atheist Identity was entered. Negative Atheists were the reference group.

Hypothesis: Because of the poor quality of the extant literature, no directional hypotheses will be offered regarding whether Negative Atheists are more or less healthy than non-atheists.

Block 4 (stepwise regression): Negative Atheist Identity is tested as a moderator for the relationships between Attendance, Prayer, and Religiosity, and SRH.

Hypothesis: Significant moderation terms will be positive (this is a one-tailed hypothesis). This will support the contention that Negative Atheists experience R/S constructs more negatively than non-atheists.

Hypothesis: When compared on the highest levels for any moderated R/S construct, Non-Believer Atheists are predicted to report poorer SRH than non-atheists (this is a one-tailed hypothesis). This would support the contention that Non-Believer Atheists experience higher levels of R/S constructs less positively than non-atheists.

Results

Self-Rated Health (SRH) was regressed onto covariates Block 1, $F(14, 75) = 5.67$, $p < .001$] and had an $R^2 = .131$. Religious/Spiritual constructs were entered in Block 2, $\Delta R^2 = .023$, $F(3, 75) = 3.72$, $p = .015$, $R^2 = .154$. However, none of the R/S constructs were significant predictors of SRH. Negative Atheist Identity was entered in Block 3, $\Delta R^2 = .000$, $R^2 = .154$, but it was not a significant predictor $t(75) = -0.16$, $p = .875$, but was non-significant. Being a Negative Atheist was not associated with poorer SRH. A stepwise regression was used in Block 4, but there were no significant interaction terms (see Table 3.2.2).

A follow-up analysis was conducted to determine if R/S constructs were predictive of Negative Atheists' SRH in a population comprised only of Negative Atheists. Results indicated that when only Negative Atheists were considered, Prayer became significant $t(75) = -2.88$, $p = .006$, 95% CI [-0.98, -0.17]. These results would suggest that although Negative Atheist Identity did not moderate the relationship between R/S constructs and health, Prayer was still more negatively experienced by Negative Atheists than by their non-atheist counterparts.

Study 3.2 Discussion

Unlike Study 3.1, Study 3.2 was unable to find any evidence of moderation of R/S constructs by the Negative Atheist Identity. However, this may have been due to R/S constructs being non-significant predictors of SRH in Block 2. It is also telling that ~35% of the Negative Atheists identified as being religiously affiliated. This substantial group division supports the idea that atheism is distinct from Religious Identity. Like Study 3.1, Study 3.2 found no evidence of reported health differences between atheists and their non-atheist counterparts. Being a Negative Atheist was not associated with any health outcome (either positive or negative). When subgroup analysis was undertaken solely on the Negative Atheist sample, Attendance and Religiosity remained non-significant predictors of SRH. However, with only the Negative Atheist sample, Prayer became a negative predictor of SRH. The moderation term for Prayer failed because of the high variability of the relationship between Prayer and SRH for non-atheists.

Discussion

Study 3 provided further evidence that R/S identities affect the relationship between R/S constructs (Attendance, Prayer, and Religiosity) and health outcomes. In Study 3.1, it was demonstrated that Positive Atheists experienced Religiosity less positively than their non-atheist counterparts did. This finding is important as it suggests that Religiosity is not intrinsically tied to positive perceptions of health, and that belief in god(s) affects how this attitude/behaviour is experienced. While both atheist identities assessed belief, it is important to note that Positive Atheist Identity was an assessment of belief and certainty, while Negative Atheist Identity was only an assessment of belief. These differences may help to explain the findings between Study 3.1 and Study 3.2.

Much like how Religious Identity and Spiritual Identity have not been previously explored as moderators for the experience of R/S constructs, atheist identities have been similarly ignored. Research on atheists and health is very limited and there is virtually no research addressing how atheists experience R/S constructs. This absence of literature is surprising given that there appears to be an obvious connection between how R/S constructs are experienced and whether a person believes in god(s). It is puzzling that there is literature that links R/S to a variety of positive health outcomes, but only a limited amount of converging evidence on the detriments of non-belief. If R/S is a positive predictor of health outcomes then one would expect that atheists [who report lower levels of spirituality (Caldwell-Harris et al., 2011) and religiosity (O'Brian-Baker & Smith, 2009)], would be less healthy in general.

However, in the current study identifying as either a Positive Atheist or a Negative Atheist was not associated with poorer health outcomes. While the implications of these findings are difficult to assess, it should be noted that Type II error is an unlikely explanation for these null effects. Power to detect even a small effect size in Study 3.1 and Study 3.2 was >.90. Given the high level of power and the presumed adequacy of the manipulation, it would suggest that belief in god(s) was not associated with higher perceptions of global health. Whereas belief in god(s) may be beneficial in circumstances of severe illness (Rosmarin et al., 2013), this finding was not replicated in the current study (which used a general sample).

While Positive Atheist Identity was associated with poorer Self-Rated Health (SRH) in Block 4 of Study 3.1, this finding was the product of data centering and the tested moderation effect. Recall that Positive Atheists reported significantly lower levels of Religiosity than non-atheists did. Moreover, non-atheists outnumber Positive Atheists approximately 97:3. The outcome of this disparity was that the centered R/S constructs were extremely close to the "average levels" of what non-atheists reported, and much further from the "average levels" of what Positive Atheists reported. The moderating term from Block 4 (i.e., Positive Atheist Identity*Religiosity) calculated the difference in SRH between Positive Atheists and non-atheists from the centered means. In other words, Positive Atheists *did* report lower levels of SRH, *but only when displaying atypically high levels of Religiosity*. When health consequences of Positive Atheist Identity were investigated using the Positive Atheist mean as the centering point for Religiosity, the group differences disappeared. Generally, there did not appear to be a health benefit

gained from belief in god(s), but more importantly, there did not appear to be a "health penalty" associated with not believing in god(s).

It was noted within the introduction that researchers tend to have atheism classed as a Religious Identity. While Positive Atheists, $\chi^2(1) = 243.13$, $p < .001$, and Negative Atheists, $\chi^2(1) = 155.06$, $p < .001$, were more likely to identify as non-religious, this was not true of all identified atheists. Over 25% of Positive Atheists (i.e., persons indicating that they were certain that they did not believe in God) identified as being religious. Similarly, over 30% of Negative Atheists (i.e., persons indicating only that they did not believe in God) identified as being religious. While atheism is undoubtedly connected to how a person identifies religiously, identifying as religious should not be construed as also believing in god(s). To collect better information on atheists, researchers should ideally ask respondents to pick a Religious Identity, and then ask whether respondents believe in god(s). Overall, asking a question of Religious Identity and inferring a response of belief is a questionable practice.

It is important to note that ΔR^2 associated with interaction effects for Self-Rated Health (SRH) were not substantially different between Study 1/Study 2 ($\Delta R^2 = .004$; $\Delta R^2 = .001$), and Study 3 ($\Delta R^2 = .002$). While it is tempting to infer that this Positive Atheist Identity is a weak moderating variable, it is important to note that ΔR^2 is not a measure of effect size, it is a measure of *change* in effect size. Consequently, change in R^2 that would be attributable to interaction terms is necessarily dependent on how much of the variance was accounted for in the previous regression block. In other words, how accurate Block 3 was at predicting SRH, will limit ΔR^2 for Block 4 within the regression model. And

because Positive Atheists only represented ~3% of the sample population, the regression coefficient for Religiosity in Block 3 of Study 3.1 (i.e., -.019), was functionally identical to the regression coefficient for non-atheists in Block 4 (i.e., -.014). In other words, the regression model was already fairly accurately describing the relationship between Religiosity and SRH for ~97% of the sample. Despite Positive Atheists reporting a very different relationship with Religiosity in Block 4 (i.e., β = -.367, 95% CI [-0.58, -0.15] for Positive Atheists; β = -.014, 95% CI [-0.07, 0.05] for non-atheists), this only affected ~3% of the predicted values. This is not suggesting that sample size affected effect size, but sample size affected *change* in effect size. Consequently, ΔR^2 may be misleading in terms of describing importance.

Limitations

Within Study 1 and Study 2, it was noted that using Religious Identity as a moderator was problematic due to the large degree of variability within the non-religious group. Study 3 improved upon this approach by using atheist identities as moderating terms to investigate the relationships between R/S constructs and SRH. However, given that atheists in both Study 3.1 and Study 3.2 identified as religious, the efficacy of this R/S identity as a moderator may have been attenuated by the intragroup variability. Consequently, Study 4 will replicate Study 3 but will do so in a sample of the non-religious. This approach should attenuate the degree of the intragroup variability associated with using a general sample.

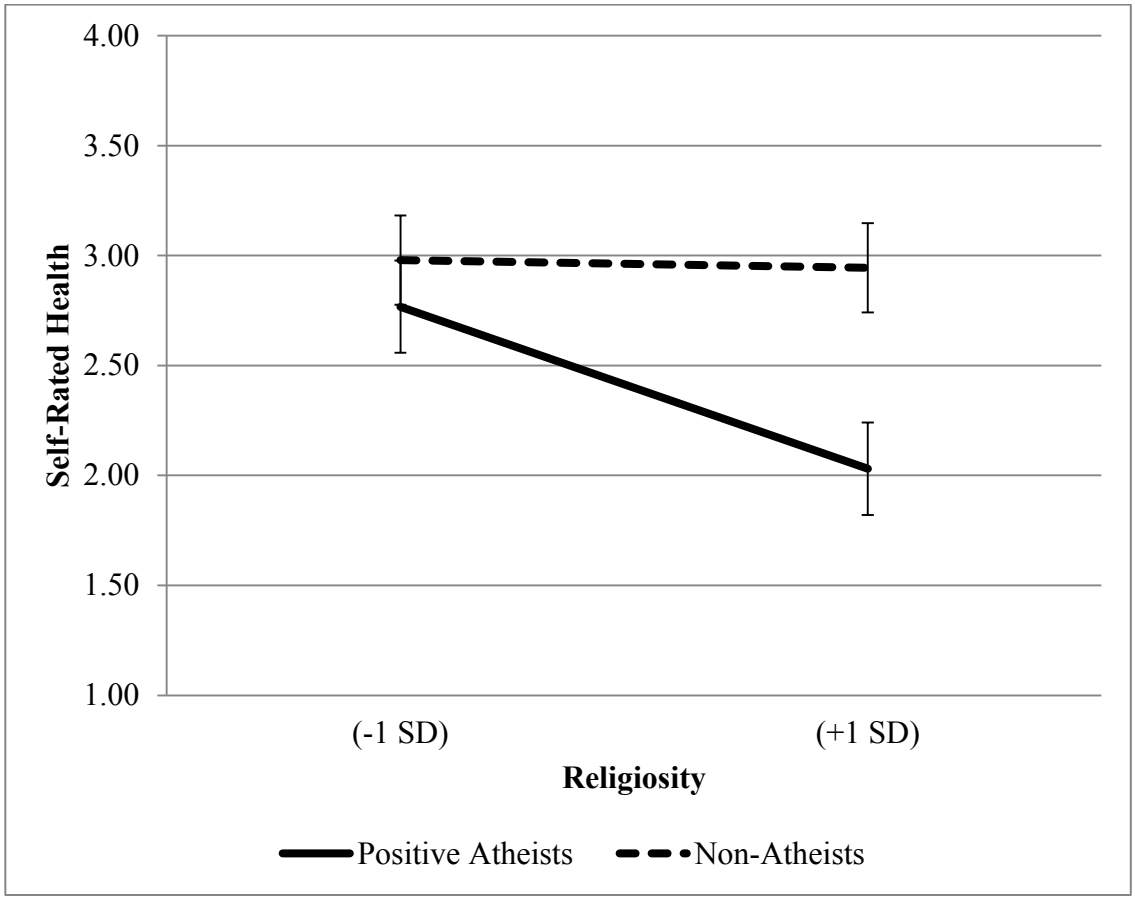

Figure 3.1.1. Positive Atheist Identity Moderates the Experience of Religiosity in the Prediction of Self-Rated Health.

Note: Values were mean centered. Error bars represent 95% confidence intervals.

Table 3.1.1

Uncentered Means and Standard Deviations for Study 3.1

	All		Positive Atheists		Non-Atheists	
	M	SD	M	SD	M	SD
Self-Rated Health	2.98	0.83	2.93	0.88	2.98	0.82
Sex (Male)	1.52	0.50	1.27	0.45	1.53	0.50
Age	45.63	16.33	45.69	17.46	45.63	16.30
Minority (White)	0.24	0.43	0.22	0.42	0.24	0.43
Partner (Single)	0.55	0.50	0.51	0.50	0.55	0.50
Education	13.61	3.02	14.53	3.46	13.58	3.01
Real Income	11.06	2.23	10.74	2.83	11.07	2.21
Attendance	4.52	2.77	1.82	1.55	4.61	2.76
Prayer	4.14	1.76	1.44	1.24	4.22	1.70
Religiosity	2.57	0.99	1.26	0.69	2.61	0.97
N =	3427		108		3319	

Parenthesized words indicate which categorical level was the lowest.

Table 3.1.2

Regression Model Predicting Self-Rated Health Using Positive Atheist Identity as a Moderator

	Unstandardized B Coefficient/ Linearized Standard Error			
	Block 1	Block 2	Block 3	Block 4
Constant	.000/.019	.000/.019	-.096/.106	-.559/.151***
Sex (Male)	-.013/.042	-.015/.044	-.016/.044	-.020/.044
Age	-.202/.021***	-.206/.022***	-.205/.022***	-.205/.022***
Minority (White)	-.020/.054	-.033/.053	-.032/.053	-.028/.053
Partner (No Partner)	.198/.044***	.173/.044***	.173/.043***	.173/.043***
Education	.181/.021***	.176/.021***	.177/.021***	.175/.021***
Income	.098/.020***	.098/.020***	.097/.020***	.097/.020***
New England (NE)	-.212/.093*	-.218/.092*	-.217/.092*	-.224/.094*
Mid-Atlantic (MA)	.022/.088	.025/.088	.025/.088	.024/.088
EN Central (ENC)	-.028/.068	-.021/.067	-.022/.067	-.026/.067
WN Central (WNC)	.038/.083	.053/.082	.052/.082	.045/.082
South Atlantic (SA)	-.034/.072	-.030/.072	-.030/.072	-.028/.072
ES Central (ESC)	.083/.101	.099/.098	.097/.098	.095/.099
WS Central (WSC)	.104/.079	.123/.080	.123/.080	.124/.080
Mountain (Mountain)	.128/.084	.125/.082	.125/.082	.121/.081
Year 2008 (2008)	.027/.042	.032/.042	.031/.042	.030/.042
Year 2010 (2010)	.061/.051	.063/.051	.062/.051	.062/.051
Attend		.106/.027***	.106/.027***	.105/.027***
Prayer		-.042/.026	-.045/.026†	-.043/.026†
Religiosity		-.016/.030	-.018/.030	-.368/.108**
Pos. Atheist ID. (Positive Atheist)			.099/.109	.561/.153***
Pos. Atheist ID*Religiosity				.354/.103***
R^2/ ΔR^2	.106/.106***	.114/.007***	.114/.000	.116/.002***

Note: Omitted region is Pacific. Omitted year is 2012. Variables are centered (except identity variables). Continuous variables are standardized. Parenthesized words indicate lowest categorical level.

†p <.10, *p <.05, **p <.01, ***p <.001

Table 3.2.1

Uncentered Means and Standard Deviations for Study 3.2

	All		Negative Atheists		Theist	
	M	SD	M	SD	M	SD
Self-Rated Health (SRH)	2.95	0.04	3.02	0.13	2.94	0.04
Sex (Male)	1.54	0.02	1.27	0.07	1.57	0.03
Age	45.55	0.79	40.03	1.97	46.25	0.84
Minority (White)	0.24	0.02	0.12	0.05	0.25	0.02
Partner (Single)	0.55	0.02	0.48	0.07	0.56	0.03
Education	13.46	0.15	14.76	0.39	13.30	0.16
Real Income	11.17	0.08	11.14	0.31	11.18	0.08
Attendance	4.61	0.13	1.85	0.22	4.95	0.14
Prayer	4.22	0.08	1.49	0.13	4.57	0.08
Religiosity	2.63	0.05	1.27	0.07	2.80	0.05
N =	596		66		530	

Parenthesized words indicate which categorical level was the lowest.

Table 3.2.2

Regression Model Predicting Self-Rated Health Using Negative Atheist Identity as a Moderator

	Unstandardized B Coefficient/ Linearized Standard Error			
	Block 1	Block 2	Block 3	Block 4
Constant	.000/.053	.000/.053	.029/.203	
Sex (Male)	.074/.104	.078/.105	.079/.106	
Age	-.183/.059**	-.210/.059**	-.210/.060**	
Minority (White)	-.118/.118	-.146/.111	-.146/.111	
Partner (No Partner)	.113/.108	.092/.105	.092/.104	
Education	.241/.050***	.245/.048***	.244/.047***	
Income	.082/.054	.073/.051	.074/.052	
New England (NE)	-.215/.261	-.207/.263	-.209/.264	
Mid-Atlantic (MA)	-.114/.161	-.116/.149	-.116/.150	
EN Central (ENC)	.084/.143	.091/.136	.088/.139	
WN Central (WNC)	.277/.305	.272/.296	.273/.294	
South Atlantic (SA)	-.193/.186	-.158/.181	-.160/.183	
ES Central (ESC)	.111/.458	.204/.462	.205/.463	
WS Central (WSC)	.074/.135	.093/.132	.092/.133	
Mountain (Mountain)	.083/.205	.088/.184	.091/.184	
Attend		.094/.055†	.094/.055†	
Prayer		-.125/.065†	-.121/.073	
Religiosity		.131/.076†	.134/.074†	
Neg. Atheist ID. (Negative Atheist)			-.033/.209	
R^2/ ΔR^2	.131/.131***	.154/.023*	.154/.000	

Note: Omitted region is Pacific. Omitted year is 2012. Variables are centered (except identity variables). Continuous variables are standardized. Parenthesized words indicate lowest categorical level.

†p <.10, *p <.05, **p <.01, ***p <.001

Study 4: Testing Atheist Identities as Moderators, in a Non-Religious Sample

The Religion/Spirituality-health literature that addresses R/S constructs often does so without simultaneously investigating the non-religious (Benjamins et al., 2006; Ellison et al., 2001; Krause et al., 2001). This approach is problematic as the non-religious could serve as a reference group when understanding the absolute benefits of R/S constructs (Kier & Davenport, 2004). Cases that only assess the religious are unable to describe whether R/S constructs (Attendance, Prayer, and Religiosity) are beneficial to the select subsample or to the broader population. While this issue has been commented on to some extent (Kier & Davenport), there is an additional issue to consider if the non-religious *are* used as a comparison group: what does being non-religious actually mean?

There is a growing body of research addressing the diversity of what it means to be a member of the non-religious group. Much of this literature addresses the variety of R/S beliefs and behaviours that members of the non-religious group engage in (O'Brian-Baker & Smith, 2009; Baker & Smith, 2009; Brown, Taylor, & Chatters, 2013; Farias & Lalljee, 2008; O'Brian-Baker & Smith, 2009). The diversity of the non-religious group is such that many subsamples of the non-religious could be thought of as religious, in everything but name (Hackett, 2014). This is not to suggest that the religious and the non-religious should be thought of as a similar group, only that the variability in the non-religious group means that it is less than ideal as a grouping variable. Because Religious Identity does not provide any descriptive information regarding beliefs and behaviours, the usage of the non-religious as a comparison group (e.g., Benjamins, 2005, Benjamins, 2006; Schnall et al., 2010; Stack & Kposowa, 2011) is of questionable utility.

The cause of this intragroup variability is largely the consequence of how Religious Identity is assessed within research. Information collected on Religious Identity often organizes persons who would not identify as "religious" into a catchall category. However, it seems that there are situations in which the only difference between the non-religious and the religious is a matter of self-identification. This is because the failure to identify as religious is not necessarily theologically motivated. For example, persons will disaffiliate with a religion for political reasons, but retain their former denominations' core tenets (Hout & Fischer, 2002). To further complicate the issue, Hackett (2014) noted that in some circumstances persons initially identified as being non-religious, but when prompted *also identified as Christian*. In short, many respondents are religious in everything except name, which complicates how religious groups should be compared.

The problem of an ambiguous group identity is applicable to *self-identified* atheists as well. Within the Religion/Spirituality-health literature addressing atheism, atheists are overwhelmingly asked to self-identify (Horning et al., 2009; Hwang et al., 2011; Sherkat, 2008). While self-identification is a fairly reliable method to determine most things, given the difficulty in arriving at an agreed upon definition of atheism, this practice only serves to lend ambiguity to this group. Hackett (2014) noted that persons identifying as atheist may also indicate that they believe in god(s) or a higher power. In other words, persons who identify as atheist [i.e., "lacking a belief in god(s)] also indicated that they, "possessed a belief in god(s)". Contradictions like this are endemic within questions related to Religious Identity. The reason for this contradiction is likely

due to the ambiguity in the atheist term, and the lack of clarification within the extant literature.

While it is positive that some researchers will include non-religious within studies, the utility of these comparisons is marred by the lack of coherent identity that the non-religious have. The inclusion of non-religious is an important step in *contrasting* the effects of R/S constructs on health outcomes between Religious Identities; however, this is only the first step in understanding R/S-health relationship. The substantive issue in any R/S identity is whether persons providing similar responses can be grouped tougher meaningfully. In Study 1 and Study 2, an argument was advanced that grouping people together irrespective of their Religious Identity or Spiritual Identity was problematic because there was no reason to assume equivalency between these groups.

However, the same argument could be made by grouping persons together on the basis of respondents identifying as non-religious. Subgroups within the non-religious will report varying levels of R/S constructs, which suggests that valuation of R/S constructs is unlikely to be uniform (O'Brian-Baker & Smith, 2009). Consequently, if one were to investigate how the non-religious experienced R/S constructs, it is unlikely that there is a generalized experience (Hackett, 2014; Hout & Fischer, 2002). Because non-belief in god(s) transcends Religious Identity, asking persons to indicate whether they believe in god(s) would likely provide relevant information even within a non-religious sample. Moreover, because atheists are more likely to identify as being non-religious, they will be better represented within the sample. Consequently, using atheist identities as moderators

for R/S constructs, should produce more apparent effects in regards to the experience of R/S constructs.

Study 4 is an extension of Study 3, insofar that identical hypotheses will be tested within a narrower range of respondents. Whereas in Study 3 a substantial portion of atheists also identified as religious, this intragroup variability was removed for Study 4 because only the non-religious were assessed. Study 4.1 will use the same data as Study 3.1, except only the non-religious will be used. Similarly, Study 4.2 will use the same data as Study 3.2, expect only the non-religious will be used.

Method

Data Source

Study 4 used the same dataset as Study 3 (Study # 34802) (Smith et al., 2013), all covariates and outcome variables are identical between the studies.

Study 4.1

Participants

Only the non-religious from Study 3.1's dataset were retained for the current study. The sample for the current study was 608 respondents (346 male, 262 female), with the average age of the respondents being 41.02 (SD = 15.48) years of age. The demographics were skewed towards theists [there were only 79 Positive Atheists (12.99% of the non-religious)]. See Table 4.1.1 for descriptive statistics.

Research Questions

Study 4.1 investigated the relationship between R/S constructs (Attendance, Prayer, and Religiosity) and Self-Rated Health (SRH) through linear regression.

Block 1: Demographic covariates were entered.

Block 2: R/S constructs were entered.

Block 3: Positive Atheist Identity was entered. Positive Atheists were the reference group.

Hypothesis: Because of the poor quality of the extant literature, no directional hypotheses will be offered regarding whether Positive Atheists are more or less healthy than non-atheists.

Block 4 (stepwise regression): Positive Atheist Identity was tested as a moderator for the relationships between Attendance, Prayer, and Religiosity, and SRH.

Hypothesis: Significant moderation terms will be positive (this is a one-tailed hypothesis). This will support the contention that Positive Atheists experience R/S constructs more negatively than theists.

Hypothesis: When compared on the highest levels for any moderated R/S construct, Positive Atheists are predicted to report lower SRH than theists (this is a one-tailed hypothesis). This would support the contention that Positive Atheists experience higher levels of R/S constructs less positively than theists.

Results

Self-Rated Health (SRH) was regressed onto covariates in Block 1 $F(16, 224) = 5.15$, $p < .001$, $R^2 = .113$. Religious/Spiritual constructs were added in Block 2 with $\Delta R^2 = .005$ and an $R^2 = .118$ (see Appendix B). None of the R/S constructs were significant positive predictors. Positive Atheist Identity was entered in Block 3, $\Delta R^2 = .000$, $R^2 =$

.118, but it was not a significant predictor $t(224) = 0.09$, $p = .926$. Stepwise regression was used for Block 4 $\Delta R^2 = .008$, $R^2 = .126$, and revealed that Positive Atheist Identity moderated the relationship between Religiosity and SRH, $t(224) = 7.18$, $p < .001$, 95% CI [0.92, 1.46] (see Figure 4.1.1). Religiosity had a negative main effect on Positive Atheists, $t(224) = -8.13$, $p < .001$, 95% CI [-1.54, -0.94], while non-atheists did not experience a main effect of Religiosity, $t(224) = -0.87$, $p = .383$, 95% CI [-0.17, 0.07] (see Table 4.1.2 for regression model).

With the inclusion of the Religiosity moderator term, Positive Atheist Identity became a predictor of SRH insofar that non-atheists had better SRH, $t(224) = 5.31$, $p < .001$, 95% CI [0.42, 0.94]. Follow-up analyses compared Positive Atheists to non-atheists on the highest level of Religiosity (i.e., "Very Religious"); at these levels Positive Atheists reported poorer health than non-atheists, $t(224) = 7.56$, $p < .001$, B = 4.66, 95% CI [3.44, 5.87]. However, these numbers should be treated with caution as there was low variability within responses. Positive Atheists did not report high levels of Religiosity meaning that these group differences are based on extrapolations of lower values. While it would be plausible that same pattern of findings would emerge between Study 3.1 and Study 4.1, there is insufficient data to reach any definitive conclusions. Unsurprisingly, Positive Atheists reported lower levels of Religiosity than non-atheists in the non-religious group $t(448) = -14.52$, $p < .001$; $M_{diff} = -0.56$, 95% CI [-0.64, -0.48]. These differences would suggest that Positive Atheists were less healthy than non-atheists, but only when Positive Atheists displayed atypically high levels of Religiosity.

Discussion for Study 4.1

Study 3.1 illustrated that Positive Atheists experienced Religiosity more negatively than their non-atheist counterparts did, and Study 4.1 replicated this finding in an exclusively non-religious population. This additional step was important as the non-religious experienced R/S constructs less positively than their religious counterparts did. In other words, the non-religious group is heterogeneous and persons who are non-religious *and* Positive Atheists, experience Religiosity more negatively than non-religious, non-atheists. In line with results from Study 1 and Study 2, R/S constructs were unrelated to Self-Rated Health (SRH). This finding provided confirmatory evidence that the non-religious tend not to experience R/S constructs (Attendance, Prayer, and Religiosity) as the religious experience them. Wherein Study 3.1 Attendance was a positive predictor of SRH, this relationship did not emerge in Study 4.1 when a narrower subset of the population was used. However, this null finding was not the product of a lack of statistical power, as Study 4.1 had the ability to detect even a small effect size ($\beta > .90$). Additionally, Study 4.1 did not find that Positive Atheists reported lower SRH than their theist counterparts, which again, suggests that a belief in god is unrelated to perceived global health.

Study 4.2

Participants

Only the non-religious from Study 3.2 were selected for Study 4.2. There were 87 persons who fit all criteria (56 male, 31 female), with the average age of the respondents

being 37.87 years of age (SD = 13.96) years of age. Within this sample, there were 43 Negative Atheists (49.42% of the entire sample). See Table 4.2.1 for descriptive statistics.

Research Questions

Study 4.2 investigated the relationship between R/S constructs (Attendance, Prayer, and Religiosity) and Self-Rated Health (SRH) through linear regression.

Block 1: demographic covariates were entered.

Block 2: R/S constructs were entered.

Block 3: Negative Atheist Identity was entered. Negative Atheists were the reference group.

Hypothesis: Because of the poor quality of the extant literature, no directional hypotheses will be offered regarding whether Positive Atheists are more or less healthy than non-atheists.

Block 4 (stepwise regression): Negative Atheist Identity was tested as a moderator for the relationships between Attendance, Prayer, and Religiosity, and SRH.

Hypothesis: Significant moderation terms will be positive (this is a one-tailed hypothesis). This will support the contention that Negative Atheists experience R/S constructs more negatively than non-atheists.

Hypothesis: When compared on the highest levels for any moderated R/S construct, Negative Atheists are predicted to report lower SRH than non-atheists (this is a one-tailed hypothesis). This would support the contention that Negative

Atheists experience higher levels of R/S constructs less positively than non-atheists.

Results

Self-Rated Health (SRH) was regressed onto covariates in Block 1 $F(14, 32) = 0.99$, $p = .484$, $R^2 = .156$. Religious/Spiritual constructs were then entered in Block 2 with $\Delta R^2 = .007$, $R^2 = .163$ (please see Appendix B). None of the R/S constructs were significant positive predictors of SRH. Negative Atheist Identity was entered into Block 3, $\Delta R^2 = .013$, $R^2 = .176$, but it was not a significant predictor, $t(32) = -1.05$, $p = .300$. This would suggest that non-belief in god(s) was not predictive of SRH. A stepwise regression was conducted for Block 4, $\Delta R^2 = .071$, $R^2 = .247$. Negative Atheist Identity moderated Prayer, $t(32) = 3.80$, $p = .004$, 95% CI [0.81, 2.75] (see Figure 4.2.1). While non-atheists did not experience a main effect for Prayer, $t(32) = 1.00$, $p = .322$, 95% CI [-0.12, 0.36], Negative Atheists experienced a negative effect of Prayer, $t(32) = -3.03$, $p = .004$, 95% CI [-2.77, -0.56] (see Table 4.2.3 for regression model).

When compared on the lowest levels of Prayer (i.e., “Never”), there were no differences between Negative Atheists and non-atheists, $t(32) = -1.85$, $p = .070$, 95% CI [-1.35, 0.06]. When Negative Atheists and non-atheists were compared at the highest level of Prayer (i.e., “Several times a day), results indicated that non-atheists reported significantly higher levels of SRH, $t(32) = 2.86$, $p = .006$, B = 4.60, 95% CI [1.36, 7.84]. However, given the wide confidence intervals associated with these group differences, these figures must be interpreted with caution. There was low variability in responses for Negative Atheists insofar that Negative Atheists did not report praying more than "Less

than once a week". Consequently, the differences between groups for the highest level of Prayer were extrapolated from lower values. While it would be plausible that Negative Atheists were to report poorer SRH when reporting the highest level of Prayer, there were insufficient data to reach any definitive conclusion. As expected Negative Atheists prayed less often than their non-atheist counterparts, $t(99) = -15.10$, $p < .001$; $M_{diff} = -0.63$, 95% CI [-0.72, -0.55].

Discussion for Study 4.2

Like in Study 3.2, in Study 4.2 R/S constructs were generally unrelated to SRH. Moreover, Study 4.2 demonstrated that while Prayer typically did not predict the Self-Rated Health (SRH) of the non-religious, Prayer negatively predicted SRH in Negative Atheists. This contrast in findings is consistent with the idea that R/S Minorities tend not to experience R/S constructs (Attendance, Prayer, and Religiosity) as the religious experience them, and that atheists are a unique group even when considering *only* non-religious persons. Like Study 4.1, Study 4.2 did not find that atheists reported lower SRH than their non-atheist counterparts, suggesting that belief in god(s) was not inherently connected to better perceived global health. The wide confidence intervals in Study 4.2 suggest that a greater number of Negative Atheists need to be sampled in order to reduce the margin of uncertainty associated with the coefficient.

Discussion

The current study confirmed that the relationship between R/S constructs and health are moderated by atheist identities. Higher levels of Prayer and Religiosity were associated with poorer health outcomes in atheists. The findings for Study 4 were

consistent with the previous three studies that R/S Minorities experience R/S constructs less positively than R/S Majorities. Moreover, these findings were supportive of the idea that the non-religious group was heterogeneous. Atheists made up substantial proportions of the non-religious population, with Positive Atheists representing 13.17% and Negative Atheists representing 48.84% of the non-religious population respectively. Given that the non-religious are sporadically used as a basis of comparison for religious groups, it is important to understand how subsets within the non-religious experience R/S constructs.

The heterogeneity of the non-religious group is due to atheists, agnostics, spiritualists, non-denominational Christians, etc. being grouped together. The variety of attitudes and behaviours within this group is extreme (Hackett, 2014). Whereas being grouped by Religious Identity provides little information as to a person's beliefs and behaviours, being grouped by atheist identities provided dramatic improvement. When persons were grouped on the basis of belief/non-belief, and these groups were more comparably represented within the population, the observed ΔR^2 grew correspondingly higher (see Table 4.3).

Because of Study 3 and Study 4, a strong case could be made that atheism functions as a better moderator than Religious Identity especially for Prayer and Religiosity. Prayer is petitioning a higher power to engage within one's life, while Religiosity is an indicator of how important religion is to a person. Either one of these concepts centre on the underlying concept that god(s) exist, so it logically follows that a person who does not hold that belief would arguably experience these R/S constructs differently. While it may seem odd that an atheist would pray at all (or rate themselves as

"religious"), these findings correspond with the existing literature on the topic. Research has suggested that the act of Prayer plays a role in one's ability to cope with adversity (Krause, 1998; Schnittker, 2003), and Religiosity is found to have the same relationship (Levin & Chatters, 1998). It may be the case if persons perceive themselves as having poorer global health, then they may turn to "metaphysical solutions".

It is important to note that while there was sufficient power to detect a small effect size in Study 4.1 (see Appendix B), power levels in Study 4.2 only allowed for a medium effect size to be detected. Consequently, it is *possible* that Negative Atheists may report lower health than non-atheists in the non-religious group, but this effect would be small (provided that it existed). However, there is no theoretical reason to suspect that atheists would report lower levels of global health than their non-atheists counterparts would. In general, non-belief does not seem to be associated with any health penalty.

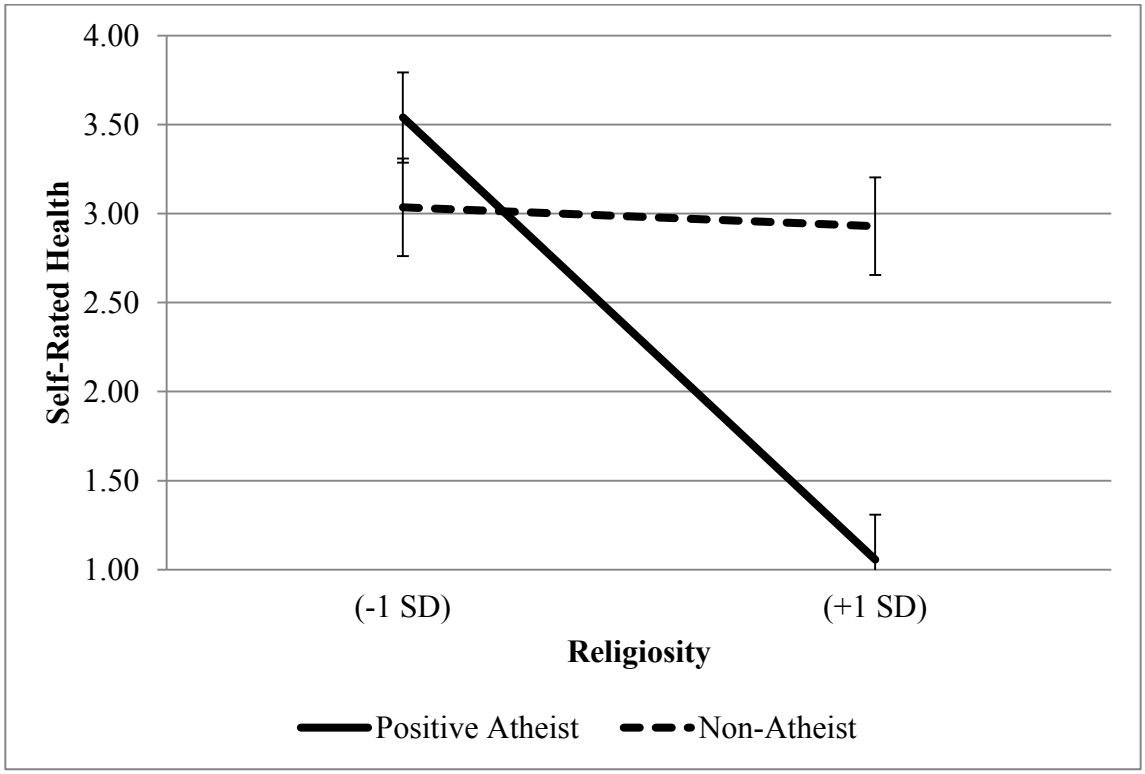

Figure 4.1.1. Positive Atheist Identity Moderates the Experience of Religiosity in the Prediction of Self-Rated Health, in a Population of the Non-Religious.

Note: Values were mean centered. Error bars represent 95% confidence intervals. Please note that low variability in responses produced abnormally wide confidence intervals.

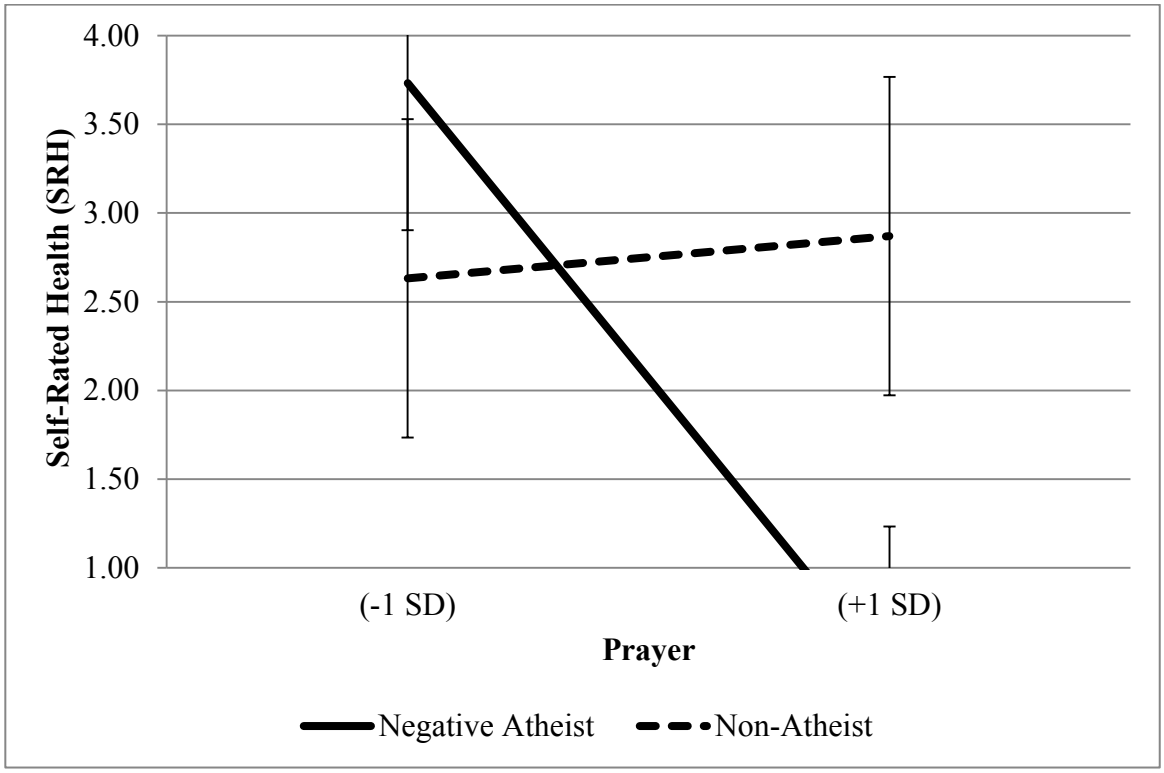

Figure 4.2.1. Negative Atheist Identity Moderates the Experience of Prayer in the Prediction of Self-Rated Health, in a Population of the Non-Religious.

Note: Values were mean centered. Error bars represent 95% confidence intervals. Please note that linearized error estimates with a small number of primary sampling produces wide confidence intervals. Low variability in responses exacerbated this issue.

Table 4.1.1

Uncentered Means and Standard Deviations for Study 4.1

	All		Positive Atheists		Theist	
	M	SD	M	SD	M	SD
Self-Rated Health (SRH)	2.98	0.77	2.98	0.84	2.98	0.76
Sex (Male)	1.43	0.49	1.24	0.43	1.45	0.50
Age	40.09	14.95	44.44	17.05	39.49	14.55
Minority (White)	0.23	0.42	0.17	0.38	0.23	0.42
Partner (Single)	0.44	0.50	0.50	0.50	0.44	0.50
Education (Years)	14.12	3.01	14.88	3.34	14.01	2.95
Real Income (in thousands)	11.03	2.36	11.02	2.44	11.03	2.35
Attendance	1.88	1.52	1.36	0.75	1.95	1.59
Prayer	2.39	1.76	1.07	0.51	2.57	1.79
Religiosity	1.46	0.76	1.03	0.17	1.52	0.79
N =	608		79		529	

Parenthesized words indicate which categorical level was the lowest.

Table 4.1.2

Regression Model Predicting Self-Rated Health Using Positive Atheist Identity as a Moderator, in the Non-Religious

	Unstandardized B Coefficient/ Linearized Standard Error			
	Block 1	Block 2	Block 3	Block 4
Constant	.000/.044	.000/.044	-.011/.125	-.682/.117***
Sex (Male)	.100/.094	.103/.094	.102/.095	.100/.095
Age	-.130/.046**	-.119/.047*	-.119/.046*	-.111/.046*
Minority (White)	.070/.120	.080/.126	.080/.126	.116/.124
Partner (No Partner)	.141/.096	.146/.092	.146/.092	.152/.092
Education	.197/.046***	.183/.047***	.184/.047***	.194/.046***
Income	.144/.045**	.139/.045**	.139/.045**	.140/.046**
New England (NE)	-.076/.361	-.079/.352	-.079/.352	-.079/.350
Mid-Atlantic (MA)	.082/.368	.073/.361	.073/.361	.081/.358
EN Central (ENC)	.116/.350	.119/.343	.118/.342	.116/.340
WN Central (WNC)	.278/.420	.273/.411	.274/.411	.268/.409
South Atlantic (SA)	-.024/.361	-.030/.354	-.031/.353	-.022/.351
ES Central (ESC)	.479/.363	.481/.359	.481/.359	.476/.356
WS Central (WSC)	.253/.347	.237/.340	.238/.340	.235/.338
Mountain (Mountain)	.038/.354	.047/.345	.047/.344	.025/.341
Year 2008 (2008)	.010/.110	.011/.109	.010/.108	.011/.109
Year 2010 (2010)	.186/.108†	.181/.107†	.181/.107†	.170/.107
Attend		.064/.045	.064/.045	.060/.045
Prayer		.003/.056	.003/.057	-.003/.057
Religiosity		-.063/.060	-.063/.061	-1.242/.153***
Pos. Atheist ID. (Positive Atheist)			.012/.133	.684/.131***
Pos. Atheist ID*Religiosity				1.189/.166***
R^2/ ΔR^2	.113/.113***	.118/.005	.118/.000	.126/.008***

Note: Omitted region is Pacific. Omitted year is 2012. Variables are centered (except identity variables). Continuous variables are standardized. Parenthesized words indicate lowest categorical level.

†<.10, *p<.05, **p<.01, ***p<.001

Table 4.2.1

Uncentered Means and Standard Deviations for Study 4.2

	All		Negative Atheists		Non-Atheists	
	M	SD	M	SD	M	SD
Self-Rated Health (SRH)	2.99	0.81	3.01	0.85	2.98	0.77
Sex (Male)	1.39	0.49	1.27	0.45	1.52	0.51
Age	37.88	13.97	40.40	14.72	35.22	12.76
Minority (White)	0.19	0.39	0.09	0.29	0.29	0.46
Partner (Single)	0.46	0.50	0.52	0.51	0.41	0.50
Education (Years)	14.07	2.92	14.92	2.72	13.18	2.89
Real Income (in thousands)	11.36	2.06	11.48	1.88	11.24	2.26
Attendance	1.75	1.38	1.20	0.53	2.32	1.73
Prayer	2.27	1.70	1.19	0.40	3.40	1.81
Religiosity	1.43	0.70	1.05	0.28	1.84	0.78
N =	87		43		44	

Parenthesized words indicate which categorical level was the lowest.

Table 4.2.2

Regression Model Predicting Self-Rated Health Using Negative Atheist Identity as a Moderator, in the Non-Religious

	Unstandardized B Coefficient/ Linearized Standard Error			
	Block 1	Block 2	Block 3	Block 4
Constant	.025/.045	.013/.046	.182/.196	-.912/.362*
Sex (Male)	.088/.090	.100/.090	.536/.258*	.439/.246†
Age	-.119/.041**	-.111/.042**	.068/.116	.092/.120
Minority (White)	.048/.114	.067/.121	.153/.266	.020/.241
Partner (No Partner)	.132/.091	.132/.088	.09/.217	.039/.226
Education	.185/.042***	.171/.043***	.105/.114	.103/.120
Income	.119/.037**	.120/.037**	.101/.106	.129/.096
New England (NE)	-.080/.330	-.086/.318	.656/.547	.725/.558
Mid-Atlantic (MA)	.027/.342	.020/.333	.662/.378†	.627/.347†
EN Central (ENC)	.109/.321	.107/.312	.758/.380†	.755/.353*
WN Central (WNC)	.245/.400	.236/.389	1.156/1.118	1.342/1.103
South Atlantic (SA)	-.035/.331	-.040/.322	.245/.493	.221/.471
ES Central (ESC)	.408/.339	.423/.334	1.275/.83	1.414/.735†
WS Central (WSC)	.198/.325	.198/.315	.876/.431*	.974/.405*
Mountain (Mountain)	.005/.326	.026/.314	.388/.374	.297/.341
Attend		.057/.039	.057/.103	.036/.096
Prayer		.005/.052	.008/.123	-1.664/.534**
Religiosity		-.057/.054	.171/.126	.155/.124
Neg. Atheist ID. (Negative Atheist)			-.373/.337	.683/.431
Neg. Atheist ID*Religiosity				1.783/.566**
R^2/ ΔR^2	.155/.155	.163/.008	.176/.013	.247/.071**

Note: Omitted region is Pacific. Omitted year is 2012. Variables are centered (except identity variables). Continuous variables are standardized. Parenthesized words indicate lowest categorical level.

†<.10, *p<.05, **p<.01, ***p<.001

Table 4.3

Comparison of Beta Values and ΔR^2 Values for Significant Interaction Terms Predicting Self-Rated Health

		Moderated R/S Construct					
		Prayer/ Meditation			Religiosity		
	R/S Identity Grouping	β	95% CI	ΔR^2	β	95% CI	ΔR^2
Study 1.1	Religious (12.11%)	.242	[0.02, 0.46]	.004			
Study 1.1	Spiritual (32.00%)				.139	[0.01, 0.27]	.002
Study 3.1	Pos. Ath. (3.15%)				.344	[0.14, 0.55]	.002
Study 4.1	Pos. Ath. (12.99%)				1.189	[0.92, 1.46]	.008
Study 4.2	Neg. Ath. (49.42%)	1.783	[0.81, 2.75]	.071			

General Discussion

The concept of identity is a classic topic within the social psychology literature. How a person perceives him/herself will invariably affect how he/she interacts with the environment (Myers et al., 2012). Identities are diverse, diffuse, and highly malleable, but most importantly, many identities are contextual. This dissertation placed a large emphasis on the unexplored connection between the salutary effects of R/S constructs (Attendance, Prayer, and Religiosity), and a person's Religious/Spiritual identities. While it may seem obvious that a R/S Minority (the non-religious, the non-spiritual, atheists) will experience Attendance, Prayer/Meditation, and Religiosity differently from a R/S Majority (the religious, the spiritual, non-atheists), this research question has been largely ignored by the existing literature.

Interestingly, while a large proportion of the literature reports a positive relationship between R/S constructs and health outcomes, this was only sporadically demonstrated in the current study. It was not uncommon to find that R/S constructs were non-significant (or even negative) predictors of health outcomes. Even with these relationships, the current series of studies was successful in demonstrating that R/S identities moderated relationships between R/S constructs and health. While it is true that not all Religious/Spiritual constructs were moderated by R/S identities, this should not be interpreted as meaning that R/S Minorities consequently benefited from R/S constructs. When only R/S Minorities were considered in follow-up analyses, R/S constructs routinely failed to be significant positive predictors of health outcomes. These findings

are consistent with the idea that R/S Minorities experience R/S constructs dissimilarly from R/S Majorities.

Consideration of R/S Minorities within Health Research

While virtually all Religion/Spirituality-health research will include the religious, spiritual, or theists, few studies will address R/S Minorities. Part of this literature shortage could be because R/S constructs ostensibly matter more to R/S Majorities than R/S Minorities. In other words, attending church, praying/meditating, and being religious, obviously fall under the domain of R/S Majorities. Consequently, examining how the non-religious, non-spiritual, or atheists experience R/S constructs is of limited utility. While this line of reasoning is parsimonious, it does not devalue the current study, it reinforces its importance. If the effects of R/S are of different relevance to R/S Majorities than R/S Minorities, then the effects of R/S constructs should be considered separately for each group. Suggesting that R/S constructs are irrelevant to R/S Minorities and then proceeding to lump R/S Minorities and R/S Majorities together, is logically incoherent.

To be fair, one could argue that the lack of literature on R/S Minorities simply reflects the groups' smaller numbers. However, this idea does not hold up to scrutiny. While it is certainly true that research addressing the non-religious (~10%-25% of the general population), non-spiritual (~30% of the general population), or atheists (~3%-10% of the general population) would apply to fewer people, equally small "minorities" are often investigated (e.g., racial minorities). Given that R/S Minorities represent millions of persons in North America and that there is a conceptual link between R/S constructs and R/S identities, it would appear that this omission of R/S Minorities is

somewhat calculated. While there are many legitimate reasons to exclude a group from consideration within research, much of the extant literature could be strengthened (or clarified) with a more consistent consideration of R/S Minorities.

Alternatively, there may be an element of confirmation bias within the literature. Because researchers expect to find salutary effects of R/S constructs, they may cease their investigations after finding a result that is consistent with the idea that "R/S is positive". Because R/S constructs are occasionally shown to have a positive relationship with a variety of health outcomes, there has been some movement within the health psychology field for R/S to play an increased clinical role (e.g., Koenig & Larson, 2001; Saucer, 1991). However, there has been notable opposition to this position (e.g., Poole et al., 2008; Sloan & Bagiella, 2001; Sloan, Bagiella, & Powell, 1999); with some researchers emphasizing the methodological, statistical, and conceptual shortcomings of the field. The current studies provide support as to why using R/S within clinical settings is premature. It is problematic to discuss clinical applications of complex social processes, without fully understanding the impact of R/S constructs. Granted, Attendance, Prayer/Meditation, and Religiosity are occasionally linked to positive health outcomes, but the experience of these R/S constructs was not uniform across all groups.

The finding that R/S Minorities tend not to benefit from R/S constructs is likely the logical consequence as to why religion and spirituality is thought to promote subjective well-being. The literature has explained the salutary effects of R/S constructs as being the product of the coherency that R/S promotes within a person's life (Antonovsky, 1993; George et al., 2002; Idler, 1987; Krause, 2011). To recapitulate, R/S

allows for a person to develop optimism and hope, because he/she is able to "make sense" of world events through this R/S lens. In a very real sense, the benefits extracted from R/S constructs are likely dependent on a person's specific worldview or ideology. Moreover, a person's R/S identities (or beliefs) are an implicit evaluation of R/S constructs. It is not a coincidence that R/S Majorities are more likely to engage in R/S constructs, these people very likely value R/S constructs more highly. Not all persons who are non-religious, non-spiritual, or atheists necessarily perceive R/S constructs as being without value, but on average, these people would probably have a worldview that placed a diminished importance on R/S constructs.

Using R/S identities *in conjunction with* R/S constructs provides vital feedback on whether a R/S construct "should" be valued by the respondent. An atheist engaged in Prayer provides more significant health-related information than a theist engaged in the same activity. This is because a non-believer engaging in Prayer likely represents the presence of a substantive issue. Atheists are unlikely to be praying to a god simply as a part of a daily ritual. Intuitively, one may expect that R/S Minorities would report an absence of R/S constructs in their daily lives, but this was not observed in the current studies. Granted, persons belonging to R/S Minorities were less likely to engage in R/S constructs; however, there was variability within these groups. Given that some R/S Minorities engage in R/S constructs, it is beneficial to inquire as to why this is the case. Why do R/S Minorities engage in these beliefs and behaviours at all? The answer to this question is unclear from the current data, but it is highly suggestive that R/S Minorities reported reduced health in every situation.

Particularly in regards to praying and religiosity, it is suspected that R/S Minorities reporting higher levels of these attitudes and behaviours are attempting to compensate for poor health outcomes. In other words, in circumstances of poor health, it is plausible that persons who are non-religious, non-spiritual, or do not believe in god(s), will turn to prayer or become more religious. While it is possible that persons report lower health outcomes *because* they are engaging in R/S constructs, this seems unlikely for several reasons. First, this described relationship is antithetical to what the literature would otherwise suggest. While there is a small body of literature describing the adverse consequences of R/S constructs, these adverse consequences stem from refusing medical treatment (Harris et al., 2006; Ng et al., 2011). Second, there does not appear to be a pathway to address why engaging in R/S constructs would then result in poorer perceived health. Granted, this may be the product of a lack of research. However, if the act of engaging in R/S constructs was detrimental, then one would expect R/S Majorities, who report higher levels of R/S constructs, to report lower health than R/S Minorities; however, this pattern does not appear.

It is important to note that the current research is not an endorsement or condemnation of R/S constructs. However, it does illustrate that R/S constructs are not *inherently* linked to positive health outcomes. Valuation is theorized to be responsible for the observed salutary effects of R/S, and the current series of studies has built upon this idea. If salutary effects are due to the valuation of religion and spirituality, then groups that do not value religion and spirituality would likely extract fewer benefits from R/S constructs. The rationale used in the current study hinges on the idea that R/S Minorities

value R/S constructs to a lesser degree. The evidence for this rationale is in the lower levels of R/S constructs reported by R/S Minorities. In its most reduced sense, this rationale is simply "persons will engage in activities in which they perceive value". Granted, it is *possible* that R/S Minorities value Attendance, Prayer/Meditation, and Religiosity similarly to R/S Majorities. But if and even if this were the case, it would only suggest that the explanation for the observed pattern of findings was incorrect, not that the findings themselves were inaccurate.

The current research contributes to the theoretical framework by demonstrating that groups that would not ostensibly value R/S constructs did indeed report less positive health outcomes. Prior to this series of studies, a casual reading of the extant literature would suggest that R/S constructs were beneficial to everyone. If this were the case, then researchers would have to account for why R/S Minorities would benefit from R/S constructs. Given that the literature consistently suggests that R/S Minorities engage in R/S constructs less frequently, and therefore presumably value R/S constructs to a lesser degree, it would be curious as to which explanation would be proffered. The current studies eliminate this problem by demonstrating that R/S Minorities do not necessarily experience R/S constructs similarly. Granted, the findings do not confirm the coherency hypothesis is accurate, but the findings are consistent with this rationale.

Definitional Specificity for R/S Identities

The current studies emphasized the importance of considering R/S identities as moderator variables. However, a major recurring theme within the series of studies was the inadequacies of many Religious/Spiritual groupings. This problem was especially

prevalent in terms of Religious Identity. In Study 1 and Study 2, Religious Identity was a problematic grouping variable because being "non-religious" does not describe an underlying set of attitudes or behaviours. Conversely, persons may identify as religious simply because that term represents a convenient social identifier, which means the definition of "religious" varies from person to person. Because R/S has intractable social roots, there is no method of delineating between devout members and nominal members of a given denomination by only asking a simple question of Religious Identity. Problems associated with Religious Identity were mitigated in Study 3 and Study 4, which used atheist identities as narrower grouping variables.

A major conceptual shift occurred between Study 1/Study 2 and Study 3/Study 4. In the earlier studies persons were asked to provide their R/S identity, while in Study 3/Study 4 the R/S identity of an individual was inferred from other data. Generally, more accurate models describing R/S constructs and health outcomes were built by using the inferred information. Persons, who were classified as Positive Atheists or Negative Atheists in Study 3 and Study 4, would not necessarily identify as such. These findings suggest that moderator terms using R/S identities that reflect explicit values, rather than implied values, may be stronger grouping variables.

This finding is consistent with the idea that the non-religious is moreso a collection of subgroups, rather than a large homogeneous group. Because of this, assessing the experience of R/S constructs while considering questions pertaining to belief/non-belief, is a desirable approach to investigating R/S. This approach would allow for the consideration of R/S identities within research, and would allow for a more

nuanced discussion on the benefits of R/S constructs to take place (e.g., Gervais, 2014). This approach would be relatively easy to adopt, as both Negative Atheism and Positive Atheism are straightforward to assess [e.g., "Do you believe in any god(s)?" and "Do you believe there are no god(s)?"]. Asking persons to indicate belief instead of identifying with a label is beneficial, because it avoids problems with the term "atheist". This is not to suggest that *only* questions regarding belief in god(s) are of importance; merely that the experience of R/S constructs is likely contingent on many underlying factors.

Because atheism is often only assessed on self-report data, the literal definition of atheism is immaterial to the data collected on atheists. This was illustrated by Hackett (2014) who noted that some "atheists" report a belief in god(s) or a higher power. This means that some persons who identify as an "atheist" may have fundamentally different beliefs pertaining to god(s). Given that atheism is literally an assessment of non-belief about god(s), there is an obvious disconnect between what atheism means, and what atheism is being presented as. A separate point is that social desirability plays a role in whether a person will identify as an atheist, which means that persons may refuse to identify as "atheist" because of stigma. Functionally, the data collected by surveys is not describing the number of persons who do not believe in god(s), and is only addressing the number of persons who identify as "atheist". This distinction may seem trivial, but it draws attention to the importance of distinguishing between persons who *identify as atheists* versus those *who are atheists*.

Another way of looking at this issue is asking a more utilitarian question: is the literature better served by self-report data in this case, or by actually assessing the number

of non-believers? The status quo for much of the research is to assess atheism as a Religious Identity. This is problematic for several reasons. First, this labelling scheme is inconsistent with measuring non-belief in god(s). In Study 3, large proportions of both Positive Atheists and Negative Atheists indicated that they were members of a religious tradition. Self-identified atheists, much like the self-identified non-religious, are not necessarily unified in their beliefs (Hackett, 2014). Second, this labelling scheme chronically undercounts persons who do not believe in god(s). Given what a person believes affects the relationship between R/S constructs and health outcomes, this is an important oversight. As demonstrated in Study 3 and Study 4, belief in god(s) provided important information in regards to whether R/S constructs should be expected to elicit an effect. Third, using questions related to beliefs would increase the amount of research addressing atheists. If atheism were treated merely as a question of belief, research addressing atheism would become more feasible.

Global Limitations

As noted in the introduction there were several limitations that were present in all studies. Using self-report data to identify persons as belonging to R/S Minorities is especially problematic given the high religiosity within the United States (O'Brian-Baker & Smith, 2009). Although this issue may be less prevalent in Canada, it may still exist and therefore play a role in how persons identify. Consequently, some persons who identified or were identified as being a member of a R/S Majority may not have necessarily been in that category. However, social desirability bias is endemic to research addressing R/S topics, and is a reality that limits the investigation into these topics.

Additionally, while the same pattern of moderation recurred in all four studies, it should be again reiterated that using different datasets from different countries may invariably affect how R/S identities influence R/S constructs-health. While both American and Canadian datasets demonstrated this same pattern of statistical moderation, this pattern may have emerged for separate reasons. In other words, while the current study had strong external validity, datasets examining different populations that the ones addressed in the current dissertation may produce different results. However, there is no reason to suspect that the findings observed in the current data represent anomalous results.

Final Remarks

Religion and Spirituality continue to play a substantive role within society and are connected to a variety of positive health outcomes. Findings that suggest Attendance, Prayer/Meditation, and Religiosity are beneficial are widespread, but should be scrutinized. Much of the extant literature has appeared to uncritically accept the idea that R/S is uniformly related to better health outcomes. While the vast majority of persons are identifiable as being religious, spiritual, or non-atheist, a substantial portion of the population does not identify as such. Research in the Religion/Spirituality-health field does not only have to consider what a person values, but also what a person does not value. Only through considering the non-religious, the non-spiritual, and atheists will the research into Religion/Spirituality-health be able to progress meaningfully.

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Appendices

Appendix A
Search String to Find Studies Investigating Moderating Roles of R/S Identities

Number of Hits	Search String Text
N = 502 80	(TX attend* OR TX church* OR TX pray* OR TX meditat* OR TX religios*) **AND** (TX relig* OR TX spirit* OR TX belie*) **AND** (TX health* OR TX "wellbeing" OR TX "well-being" OR TX "well being" OR TX "self-rated health" OR TX "self rated health" OR TX "satisfaction with life" OR TX "life satisfaction" OR TX happ* OR TX "mental health continuum" OR TX "MHC" OR TX "MHC-SF")
N = 25 686	(TX attend* OR TX church* OR TX pray* OR TX meditat* OR TX religios*) **AND** (TX relig* OR TX spirit* OR TX belie*) **AND** (TX health* OR TX "wellbeing" OR TX "well-being" OR TX "well being" OR TX " self-rated health" OR TX "self rated health" OR TX "satisfaction with life" OR TX "life satisfaction" OR TX happ* OR TX "mental health continuum" OR TX "MHC" OR TX "MHC-SF") **AND** (TX "non religious" OR TX "non-religious" OR TX unaffiliat* OR TX "nones" OR TX apostat* OR TX irrelig* OR TX atheis* OR TX "non-belief" OR TX "non belief" OR TX "nonbelief" OR TX agnostic* OR TX "low spirituality" OR TX "nonspiritual" OR TX "non-spiritual")
N = 637	(TX attend* OR TX church* OR TX pray* OR TX meditat* OR TX religios*) **AND** (TX relig* OR TX spirit* OR TX belie*) **AND** (TX health* OR TX "wellbeing" OR TX "well-being" OR TX "well being" OR TX "self-rated health" OR TX "self rated health" OR TX "satisfaction with life" OR TX "life satisfaction" OR TX happ* OR TX "mental health continuum" OR TX "MHC" OR TX "MHC-SF") **AND** (TX "non religious" OR TX "non-religious" OR TX unaffiliat* OR TX "nones" OR TX apostat* OR TX irrelig* OR TX atheis* OR TX "non-belief" OR TX "non belief" OR TX "nonbelief" OR TX agnostic* OR TX "low spirituality" OR TX "nonspiritual" OR TX "non-spiritual") **AND** (TX "statistical moderation" OR TX "moderation effect" OR TX "moderating effect" OR TX "moderating variable" OR TX "moderation term" OR TX "statistical mediation" OR TX "mediation effect" OR TX "mediating effect" OR TX "mediating variable" OR TX "mediation term" OR TX "interaction effect" OR TX "interacting variable" OR TX "interaction variable" OR TX "interaction term" OR TX "cross-product" OR TX "cross product" OR "higher order" OR "higher-order")

Appendix B
Explanation of Analytic Procedures

In an effort to save space and to avoid repetition, analytical commonalities between Study 1, Study 2, Study 3, and Study 4 will be discussed in this section. These similarities include variable weighting, coding, analytical approaches, and statistical analyses. Each of these commonalities will be briefly explained and their respective significance to the current studies will be addressed. Study 1 and Study 2 were grouped together because they had numerous analytical commonalities. Similarly, Study 3 and Study 4 were grouped together because they had numerous analytical commonalities.

Analytical Approaches Common to All Studies

Centering. Centering improves data interpretability within regression analysis (West et al., 1996). Regression models generate coefficients and an associated intercept value by assuming that every predictor variable has a value of zero. However, in many circumstances zero is a non-valid value for the variables being assessed. For example, if a scale for Variable X ranged from 1-5, the regression model will still assume Variable X had a value of zero in order to calculate the regression model.

Centering is the subtraction of the mean of a variable, from the variable itself. This practice does not change the scale of the variable and it does not change the significance of the coefficients. However, the intercept can now be interpreted as the average level of the outcome variable when all predictors are zero. Because centering allows for the average of a variable to be zero, it means that the regression model is being calculated by using the average effect of the variables in the equation. Religious/Spiritual

Identities were not centered because the resulting regression equation would show the average consequence of those R/S identities, when the consequences of a *specific* identities were of interest.

Standardization. After centering the variables, each continuous variable was divided by its standard deviation. This action, following the centering of variables in the previous step (see above subsection), functionally standardized all continuous variables. Consequently, interpreting coefficients for continuous variables could be done in terms of standard deviations, and interpreting coefficients in terms of categorical variables could be done by group membership (e.g., moving from male to female). The process of this selective standardization did not change the significance values of the relevant coefficients.

Appropriateness of linear models. Linear regression requires several assumptions be met (Field, 2009). These assumptions were not explicitly addressed in the main text although they were considered for each study. All regression models used continuous predictor variables or appropriately coded dichotomous variables. Normalcy was purposively not investigated for many of the studies. It is a common misconception that outcome variables must be normally distributed for regression analysis. While this assumption is correct for smaller samples, within larger populations reliance on the Central Limit Theorem is acceptable (Lumley, Diehr, Emerson, & Chen, 2002). Lumley et al. noted that with large samples (i.e., 500+ people) of extremely non-normal data, linear regression was an effective and accurate method in which to establish a statistical relationship. Finally, regression analysis assumes that independent variables are

orthogonal to one another. Highly correlated variables may produce situations in which a variable is overvalued or undervalued simply because of its relationship with another predictor variable (i.e., multicollinearity). Multicollinearity was assessed with Variance Inflation Factor (VIF), in which values above 10 are thought to indicate problematic multicollinearity (Field, 2009). Multicollinearity was not an issue within any of the current studies, and VIF values did not exceed 3.00 for any non-cross-product variable in any regression model.

Omitted correlation tables. Correlation tables were not provided for any of the four studies. This was because Stata 13 did not support weighted correlation tables, which would have been the most appropriate approach to use with the datasets. While using unweighted correlation tables was possible, this would have provided misleading descriptive information regarding the relationships between the variables. Arguably, the omission of the correlation tables (which served no analytical role) was a better option than providing misleading data.

Analytical Approaches Unique to Study 1 and Study 2

Survey weights. Weighting variables (i.e., sampling weights) were designed by Statistics Canada to accurately reflect the composition of the population (e.g., age, sex, race, etc.). The single weighting variable used in Study 1 and Study 2 was calculated by the Statistics Canada (2013) and by the Social and Aboriginal Statistics Division (2010) to reflect various factors related to strata, primary sampling units, non-response rate, etc. To use this weighting variable, it had to be adjusted for usage with a subsample, per the

instructions of the data file's documentation (Statistics Canada; Social and Aboriginal Statistics Division).

Heteroscedasticity. Study 1 and Study 2 addressed issues with heteroscedasticity differently than Study 3 and Study 4. Generally, linear regression assumes residual errors are unrelated to the predicted values (i.e., the data are homoscedastic). If error terms and predicted values are related, the estimate of the error is biased. As a consequence, the estimated relationship between the individual predictors and the outcome variable (i.e., coefficients) remains the same, but the error associated with an estimate will grow and thus should be corrected (Long & Ervin, 2000). A researcher is able to correct for this issue by using robust standard errors. With usage of probability weights (i.e., Stata's –pweights– option), Stata automatically provided robust standard errors (HC1) to control for Type I error. It should be stressed that the Religion/Spirituality-health literature rarely discusses homoscedasticity and corrections error estimates are scarce. In a sense, this dissertation is somewhat anomalous as corrections for heteroscedasticity were made.

Power. Power was sufficient in Study 1.1, Study 1.2, and Study 2 ($\beta > .99$) to detect even a small effect size ($f^2 < .02$). Power was assessed with G*Power v.3.1.9.2.

Analytical Approaches Unique to Study 3 and Study 4

Sample weights. The user file for the American General Social Survey provided a variety of sophisticated weights for the user. The released weighting variables included information on strata, primary sampling units, and individual sampling weights. This information regarding primary sampling units and strata was valuable as it allowed for a

better estimate of error within the analysis, and Stata is able to use this information in its complex samples commands [i.e., -svy- (Smith et al., 2013)]. This approach is necessary, otherwise issues with non-independence of error arise within regression models, leading to inflated Type I error.

A common issue is that for strata with only a single primary sampling unit, regression models will not work. Briefly, this is due to no variance existing within the strata. Because variance is necessary in calculating regression coefficients, the regression model would result in an error. To avoid this problem the researcher specified that single primary sampling units be scaled. In essence, the regression models "ignored" this problem by imputing the average variance from other strata. Primary sampling units were used as denominator degrees of freedom in both Study 3 and Study 4. For personal weighting variables, the researcher used the WTSSNR option as it accounted for the non-response rate in addition to other selection factors.

Heteroscedasticity. Heteroscedasticity was corrected for in Study 3 and Study 4 by the usage of linearized standard errors, which are functionally identical to robust standard errors. This option is selected automatically when using the –svy- prefix.

Power. Power was sufficient in Study 3.1 ($\beta > .99$), Study 3.2 ($\beta > .80$), and Study 4.1 ($\beta > .80$) to detect a small effect size ($f2 < .02$). However, Study 4.2 only had sufficient power ($\beta > .80$) to detect a medium effect size. Power was assessed with G*Power v.3.1.9.2.

Omitted F statistics. Stata did not provide ANOVA tables or allow for hierarchical regression when using "svy, subpop():" commands in Study 4. Because of

this, F statistics for Block 2 could not be reported. R statistics were calculated manually in Block 2, Block 3, and Block 4. F statistics were calculated manually in Block 3 and Block 4.

T-statistics. In cases where atheists/non-atheists were compared on average levels for R/S constructs, regression models were used to derive the t-statistic.

Appendix C
Homogeneity of Moderator Terms for Study 1 and Study 2

The analytical strategy used in Study 1 utilized Religious Identity and Spiritual Identity as moderating variables. Unfortunately, Religious Identity and Spiritual Identity do not represent homogenous groups (Hackett, 2014), which could weaken the observed strength of the moderating variable. To compensate for this issue, directional hypotheses were used as a method of increasing power. Directional hypotheses were consistent with the rationale outlined in the introduction of Study 1, which emphasized that the non-religious on the whole were expected to value R/S constructs less positively than Christians were. The basis of this hypothesis was that the collective group experience of R/S constructs in the non-religious group was less positive than the collective group experience of R/S constructs within the Christian group. However, using directional hypotheses in these circumstances would assume that different groups were similar. Significant differences between provinces on R/S constructs may indicate that the overarching rationale for using one-tailed hypotheses was inappropriate. In Study 1 and Study 2, levels of R/S constructs were compared between provinces to ensure reduced heterogeneity.

Study 1

As a precaution, a series of t-tests were conducted that compared the non-religious, Christians, Non-Spirituals, and Spirituals on levels of R/S constructs in different provinces. No significant differences emerged from these comparisons. In other words, the non-religious in NB were similar to the non-religious in MB, Christians in NB

were similar to Christians in MB, Non-Spirituals in NB were similar to Non-Spirituals in MB, and Spirituals in NB were similar to Spirituals in MB. Because of this similarity, Religious Identity and Spiritual Identity were thought to be adequately homogenous grouping variables to utilize one-tailed tests for investigating statistical moderation.

Study 2

As with Study 1, there were concerns over heterogeneity with the Religious Identity manipulation. This concern grew considerably in Study 2 due to the large national sample, which had data from all ten provinces. The most direct method of improving heterogeneity across R/S constructs was to delete provinces that were significantly different from other provinces on R/S constructs. This was accomplished by using oneway ANOVAs and post-hoc Scheffe tests. Provinces that substantially differed from five or more other provinces were dropped.

The non-religious group was compared across provinces on R/S constructs. A oneway ANOVA was only significant for Attendance, $F(9, 2954) = 5.55$, $p < .001$. Post-hoc Scheffe tests revealed that the non-religious in New Brunswick reported higher levels of Attendance compared to the non-religious in six other provinces. With the exclusion of New Brunswick ($n = 751$), a oneway ANOVA was still significant for Attendance $F(8, 2954) = 2.22$, $p = .023$, but post-hoc Scheffe tests revealed no significant differences between the non-religious from different provinces. Overall, only New Brunswick was eliminated from the dataset.

Christian groups were compared across provinces on R/S constructs. A oneway ANOVA was significant for Attendance, $F(8, 10127) = 33.12$, $p < .001$,

Prayer/Meditation, $F(8, 10127) = 11.40$, $p < .001$, and Religiosity, $F(8, 10127) = 49.89$, $p < .001$. Post-hoc Scheffe tests revealed that Christians from Quebec reported significantly lower levels of Attendance than Christians from the other eight provinces, significantly lower levels of Prayer/Meditation than Christians in five other provinces, and significantly lower levels of Religiosity than the other eight provinces. With the exclusion of Quebec ($n = 2836$), only the oneway ANOVA for Attendance remained significant $F(7, 7622) = 5.36$, $p < .001$; but post-hoc Scheffe tests revealed only minimal differences between provinces. Overall, only Quebec was eliminated from the dataset.

Precautionary steps. In a final pre-analysis investigation, entire provinces were compared on R/S constructs. Given that these measurements would reflect provincial differences on R/S constructs, provinces would be deleted if they differed from half of the other provinces on two or more R/S constructs. A oneway ANOVA was significant for Attendance, $F(7, 10028) = 34.03$, $p < .001$, Prayer/Meditation, $F(7, 10028) = 16.10$, $p < .001$, and Religiosity, $F(7, 10028) = 15.16$, $p < .001$. British Columbia reported significantly lower levels of Attendance for all seven provinces, lower levels of Prayer/Meditation for all seven provinces, and reported significantly lower levels of Religiosity for six other provinces. These finding made conceptual sense as BC is Canada's least religious province; however, these substantive differences across every R/S construct could represent a significant confound. After some consideration BC ($n = 1719$) was excluded from the dataset due to these differences. The rationale for this was that the non-religious were arguably "less a minority" in BC than elsewhere in Canada, which could conceivably affect how R/S constructs were experienced. After the exclusion

of BC, all other provinces fit the inclusion criteria. With these adjustments to the sample (N = 8253), data analysis proceeded with one-tailed hypotheses.